



3 1761 09628032 6

Fine Binding

THE CARSWELL COMPANY LIMITED

THE

BRITISH JOURNAL

OF

15
6 133
7

DENTAL SCIENCE.

VOL. XXXIII.

JANUARY—DECEMBER, 1890.

LONDON :

289 & 291, REGENT STREET, W.

British Journal of Dental Science.

No. 527. LONDON, JAN. 1, 1890. VOL. XXXIII.

SOME POINTS IN THE ETIOLOGY, DIAGNOSIS AND TREATMENT OF EMPYEMA OF THE ANTRUM.

BY FELIX SEMON, M.D., F.R.C.P.

Concluded from page 1092.

OF the objective symptoms under such circumstances, by far the most important, is the actual observation of the discharge of pus from the opening of the antrum. Sometimes it is possible, with good illumination and after introduction of a nasal speculum, to see without further preparation pus in the middle meatus, *i.e.*, between the middle and lower turbinated bones, or between the middle turbinated bone and the external wall of the nose, running downwards in a small, thick or thin, yellow or whitish stream, whilst the rest of the nostril, especially the *upper* portions, appear perfectly healthy. In other cases in which the mucous membrane of the nose is much swollen, previous cocainisation may be necessary, or the swollen mucous membrane of the middle turbinated bone may have to be pressed aside with a blunt probe before pus will make its appearance. Schoeller and Walb have drawn attention to the fact that in such cases sometimes a pulsating light reflex is seen on those parts of the nasal mucous membrane on which first the fluid will appear, analogous to the pulsating light cone on the tympanum in cases of otitis media.

However, even if pus should be seen in the region corresponding to the ostium maxillare of the antrum, the objection might still obtain that it had by accident found its way just to this part, and that it may actually come from one of the other accessory cavities of the nose. The most important feature, therefore, in establishing a certain diagnosis will consist in actually demonstrating, in all cases, the direct passage of the matter from the antrum—a procedure which is simply indispensable, when the patient has carefully cleaned

his nostrils just before consulting the practitioner, or when all the secretion having been evacuated in the morning, not so much accumulation has yet taken place at the hour of the consultation that the secretion could be spontaneously discharged into the nose.

The method of investigation is very simple. The nose having been thoroughly cleansed, and it having been ascertained by inspection that the nostril corresponding to the suspected antrum is quite free from secretion, the patient is told to lie down across a chair or on a sofa, supporting himself with both hands on the floor, head downwards, *but not too low*, and the *affected* side *uppermost*. After remaining for about ten to fifteen seconds in that position he is at once to resume his position in the chair without either blowing or inspiring through his nose. The speculum having been re-introduced pus will be seen in the middle meatus in greater or smaller quantity, if the discharge really comes from the antrum. This simple and useful procedure has been introduced by Bayer and B. Fränkel. I would especially recommend (1) that the head be not held *too low*; (2) that the patient does not remain *too long* in the inverted position, because the purulent secretion, if thin and abundant, is apt to gravitate under such circumstances into the *upper* parts of the nostril, when it may be impossible to ascertain from *which* of the accessory cavities it actually comes.

It goes without saying that all the signs and means of diagnosis so far mentioned, which are referable to the discharge of the secretion into the nose, will be only available when such a discharge can take place, *i.e.*, when the ostium maxillare of the antrum is unobstructed. Obstruction of this opening greatly modifies both symptoms and means of diagnosis. Such an obstruction may be caused by very thick, creamy consistence of the pus, especially if the opening be naturally narrow, by swelling or hypertrophy of the nasal mucous membrane in the neighbourhood of the ostium, by nasal polypi or foreign bodies in the nose occluding the opening, or by the formation of granulations around it, etc.

In such cases the symptoms which were formerly held to be characteristic of the affection, and which has been mentioned above, are found more or less developed.

If the exudation be at all considerable, the sinus becomes distended and its walls greatly thinned. The zygomatic region, the hard palate, the fossa canina, the inner wall, the alveolar region above the molars, the parts just below the

orbita—any of these may bulge considerably forward and give the finger the sensation of crackling or of an elastic swelling. In extreme cases complete occlusion of the corresponding nostril is being produced by distension of the inner wall of the cavity, or the bulbus is pushed upwards and exophthalmos ensues. If communication with the nose is not re-established under such circumstances perforation may occur anywhere and a fistula be established in the gums, or in the hard palate, etc. In almost all cases in which free secretion is impossible, violent neuralgic pains in the face and in the teeth of the upper maxilla of the affected side are complained of. Swelling of the soft parts of the cheek, sometimes of an erysipelatous character, also occurs.

In many cases the obstruction is not of a permanent, but of transitory character. In such cases the patient, whilst suffering acutely during the time of obstruction, is greatly relieved as soon as from some cause or other the ostium becomes temporarily free and the purulent secretion finds its natural outlet into the nasal passages. Often, however, after a short time the opening becomes again obstructed, the old symptoms return and a fresh period of suffering occurs, to be terminated again by discharge of the accumulated secretion into the nose. Thus the affection may and does often exist for many years with alternating improvement and aggravation.

I have but briefly touched upon the cases in which actual distention of the walls of the cavity or fistulæ exist, for the reason that in those cases the diagnosis will as a rule offer no difficulties. Much more difficult, however, is the diagnosis in cases of temporary obstruction of the semilunar hiatus, or in such cases of nasal discharge in which, though the symptoms decidedly point to the passage of the pus from one of the accessory cavities of the nose, it cannot be made out with certainty, owing to excessive narrowness of the nasal cavity or to swelling or thickening of its mucous membrane or to the presence of nasal polypi, etc., which of these cavities, the maxillary sinus, or the ethmoidal cells, the frontal or the phenoid sinus is the affected part. It must also not be forgotten that several of these cavities may be *simultaneously* diseased.

In such cases a great many measures have been recommended, calculated to demonstrate the actual proveniencé of the pus from the antrum. Thus Stoerk, Bayer, Hartmann and others have recommended to introduce, after previous cocainisation, a fine syringe or a slender ear-catheter through the middle meatus into the natural opening, viz., the semilunar hiatus, and to inject through it some antiseptic solution

with the triple object of clearing the obstructed opening, of demonstrating the source of the secretion, and of healing the suppurative process itself. Though it cannot be doubted that in a small number of cases this procedure is perfectly feasible, in the majority of cases it will be found, owing to the anatomical conditions of the parts, that it is very difficult, often impossible. Michel recommends forced injection of water into the nose, in the hope that the obstruction of the ostium maxillare, if only due to inspissated matter, will give way. With the same object in view Hartmann uses the air douche, in the form of Politzer's bag. To this Ziem objects, arguing that parts of the foul secretion from the antrum may thereby be forced into the middle ear and may there set up serious purulent inflammation. He therefore employs for the same purpose a catheter, which is introduced through the mouth and upward behind the palate, and which is connected with an air balloon. By compression of the latter whilst the patient closes both nostrils condensation of the air in the cavity is obtained in the direction from behind forward, and the danger indicated by him is avoided. Hopmann, Stoerk and Walb suggest the introduction of cotton plugs or of laminaria bougies into the middle meatus. Link recommends percussion of the antrum. He presses a rounded stick made of wood, of about a finger's length, against the hard palate close to the second molar and percusses the free end with his finger. According to his experiences a clear sound is heard under normal conditions which becomes dull when there is fluid in the antrum.

Inasmuch as none of these methods can boast of universal success, though each of them has, no doubt, given satisfactory results in a number of cases, comparatively often the exploratory opening of the antrum becomes necessary. This may be either performed from the alveolar process or from the nose. If one of the teeth, the alveoli of which are known to be in close proximity to the floor of the sinus, be diseased, it will be most natural to remove the tooth and to penetrate by means of a drill or of a trocar through the alveolar process into the cavity. A similar procedure may also be adopted if the teeth should have been already previously drawn, provided that there is not too much shrinking of the upper maxilla. Ziem even formerly recommended the probatory removal of a *healthy* tooth, if necessary. Against this proposal, however, much opposition has been raised, and in his last communication he supplants his former recommendation by the propo-

sal to open the antrum *between* the two bicuspidis or between the second bicuspid and the first molar by means of a dental engine, and of a *very* fine drill of the diameter of one and a half mm. and of two to three cm. length. He states that by means of this procedure he has sometimes been able to open the antrum in from five to seven seconds, and that no damage is done to the patient. Tornwaldt, however, at the last meeting of German naturalists, demurred to the last-named statement, and said that the operation was frequently difficult, not free from risk and often *productive* of suppuration in the antrum. To obviate the establishment of a communication between the antrum and the cavity of the mouth for mere exploratory purposes, Krause, Schmidt and Tornwaldt recommend exploratory puncture through the *inner* wall of the antrum, by way of the lower meatus of the nose. Krause avails himself for this purpose of a specially constructed trocar, which is pushed into the antrum after previous cocainisation through the nose, below the lower turbinated bone, as far as possible backwards; Schmidt uses a strong curved syringe and Tornwaldt a small trephine, which is put into motion by a winch. The last-named method has only so recently been introduced that no opinions have yet been expressed as to its usefulness; of Krause's trocar it is stated that Heryng that in his cases it could not be used, owing to narrowness and swelling of the lower parts of the nose; and as to Schmidt's syringe I can only say that in one of the two cases in which I have attempted to use it I did not succeed, in spite of using considerable force in perforating the very thick internal wall of the antrum, and that in the other I drew only blood, although on subsequent opening of the cavity through an alveolus pus was found in the antrum. Of course, the number of my experiences is much too small to base upon them any condemnation of the method, but I thought it right to mention them, in order to show that this otherwise simple and safe method can as little boast of applicability in all cases as apparently most of the other procedures which have been recommended.

That our diagnostic powers at the present time are still far from being satisfactory is evident from the number of cases in which the antrum has been opened and no pus has been found. Thus so experienced an observer as Ziem states in his latest contribution that he did not find pus in the antrum in nine per cent. of the last sixty-seven cases, in which he opened the antrum by means of the dental engine!

Under these circumstances it would be a real boon, if the latest addition to our diagnostic means, which has quite recently been made by Heryng, should fulfil the high expectations which this distinguished author entertains. Acting upon a suggestion the merit of which belongs to the late lamented Professor Voltolini, Heryng has, in ten cases observed by him within the last six months, with certainty diagnosed empyema of the antrum by electric transillumination (if I may coin that word) of the face. For this purpose he introduced in a *perfectly dark* room a small incandescent lamp of *at least* five volts., attached to a tongue depressor, into the patient's mouth. The patient closes the mouth, and the electric current is established, when the bones of the face, according to Heryng's experience, are perfectly lit through, and appear up to the orbit bright red. Now, if there should be empyema of the antrum, the side *remains dark*, and the diagnosis is secured. Only in one case did he not succeed, owing to abnormal thickness of the bones of the face. For further particulars I must refer to the original. I have not yet had the opportunity of testing the method, but a recommendation coming from Heryng must always command attention, and I can only repeat that, if the future should show the general applicability of the method, a great boon will have been conferred upon both patients and practitioners.

I finally come to the question of treatment.

Up to the beginning of 1886 three methods were used :—

- (1) Simple drainage through the natural opening.
- (2) Opening of the antrum through an alveolus (Cooper's method).
- (3) Opening of the antrum through the fossa canina (method of Desault-Küster),

In 1886, almost simultaneously with Ziem's first publication, Mikulicz, then of Krakau, now of Königsberg, recommended opening the antrum through the lower meatus with a specially constructed stiletto, and shortly afterwards Krause introduced, instead of the latter, the trocar above referred to. Of these four methods the drainage through the natural opening has found but few adherents and given not very encouraging results. This is easily intelligible, from the previously mentioned difficulty of introducing catheters, &c., into the hiatus, and also from the fact that the opening is situated so high above the floor of the cavity. Free drainage therefore, is difficult under all circumstances, and the treatment can hardly be carried out by the patient himself, even if

in accordance with Bayer's proposal, the ostium should have previously been enlarged by means of the galvano-cautery or otherwise.

Also the last-named method, the opening from the fossa canina, has met with but little favour, though Christopher Heath and Morton Smale have had good results with it, whilst quite recently Schech has stated that, especially in very obstinate cases, which resisted all other forms of treatment, he has finally obtained a cure by drilling a comparatively large opening through the fossa canina into the antrum, and plugging the cavity with iodoform gauze.

The real battle, however, has been and is being fought ever since 1886 between the method of opening the antrum through an alveolus and that of opening it from the lower meatus. The opinions as to the preference of each of those methods are just as curiously divided as those on the etiology and on the best mode of diagnosing the disease. Whilst Mikulicz, B. Fränkel, Krause, Friedländer, Bronner and Schiffers prefer the route through the nose, Christopher Heath, Ziem, Schmiegelow, Krieg, Fletcher Ingals, Bayer, Heryng, Greville Macdonald, Scheck prefer the alveolar operation, and Moritz Schmidt has returned to it, because his patients often found it difficult or impossible to carry out the after-treatment.

At the present moment the contest is as fierce as ever. The adherents of the alveolar method claim for it (1) that in many cases, in order to get rid of the *fons et origo mali*, the extraction of one or several carious teeth is *ipso facto* necessary, and that it is, therefore, natural that the simple act of perforating through the alveolus should at once be added to the removal; (2) that the opening thus produced corresponds to the most *dependent* part of the cavity, and that the drainage, therefore, will be most perfect; (3) that the patient can easily carry out the after-treatment himself. The opponents, on the other hand (*e.g.*, Friedländer), argue (1) that often a healthy tooth had to be drawn; (2) that the constant running of pus into the mouth was a source of great annoyance to the patient; (3) that by creating and keeping open a communication between antrum and mouth, the entrance of particles of food and of pathogenic micro-organisms of the oral cavity into the antrum was facilitated and the suppuration in the latter actually kept up.

To my mind the arguments of the adherents are not counterbalanced by those of the opponents of the method. I can

only state that I have never seen suppuration of the antrum co-exist with a perfectly healthy set of teeth, and that, though I do not in the least doubt its occasional occurrence, I am convinced it does not occur "often." That in the rare cases in which the teeth are found healthy the operation from the nose, if practicable, may be preferable, I will not for a moment contest; but I fail to see why the exception should be made the base of the attack against the more natural method in the majority of cases.

With regard to the second objection, viz., that the running of pus into the mouth was a source of great annoyance to the patient, I must say that I have never heard that complaint from any of my patients who have been operated upon by the alveolar method, and I do not think that there is so much difference between a constant annoyance to the gustatory and the olfactory nerves that this could much influence one's decision; for it must not be left out of consideration that if the discharge runs into the nose instead of into the mouth, the patient will continue to suffer from the trouble for which he has consulted the practitioner, viz., the unpleasant odour, so long as the discharge is foetid, in addition to having to use his handkerchief almost constantly.

The third objection, viz., that by the establishment of a communication between antrum and oral cavity, food and micro-organisms penetrated from the latter into the former and kept up the suppurative process, would certainly weigh very heavily with me, if it could be only shown (1) that this really occurs, (2) that the operation from the nose is *superior* to that from the mouth in that the suppuration sooner ceases and the after treatment is curtailed. For it cannot be denied that the long duration of the after treatment is the weakest point in our present system. Though occasionally the suppuration ceases a few weeks after the operation, especially in comparatively recent cases, under the use of mild, tepid, anti-septic and disinfectant solutions (carbolic acid, borax, iodine, salt, permanganate of potash, &c.), by means of Christopher Heath's apparatus, yet there are, unfortunately, other cases, in which the suppuration, in spite of free drainage from the mouth through the antrum and the nose, continues for many months. Here certainly an improvement would be *most* desirable.

But what I fail to see is (1) that it has actually been shown that micro-organisms, &c., enter the antrum when the opening is properly made, when a suitable cannula is inserted and

when its lower opening is closed at meal times, and (2) that when the antrum is opened through the nose the after treatment is remarkably shorter. In the same paper in which Friedländer attacks the alveolar method, he confesses, in pleading for the nasal operation, that "further observations have shown that a true cure of the disease could only be obtained in rare, more favourable and more recent cases." This, surely, shows no superiority of the nasal over the alveolar method! Friedländer finds the cause of the failure apparently in the irritation of the mucous membrane of the antrum, caused by the frequent injections of *fluids*, and reports that the results have been much more satisfactory, since these injections have been replaced, after *one* thorough injection of water and cleaning of the cavity from pus, by insufflations of iodoform. I think myself that this would be an important progress, if further observations should corroborate Friedländer's statement; but it need not be said that the *dry* method could just as well be employed from an opening made through an alveolus.

To avoid all misunderstandings I beg to say distinctly that I personally have no theoretical objections to the nasal operations as such, and that very possibly my present views may be changed some day; but if one hears from trustworthy observers that sometimes considerable hæmorrhage is caused by them, that comparatively often, in consequence of narrowness of the passages or of thickness of the nasal bones, their performance is difficult or even impossible, that many patients have considerable difficulty in carrying out the after treatment, &c., one is the less inclined to give up a tried method in their favour, if one remembers that in the majority of cases defective teeth have to be extracted in order to remove the source of the whole trouble, and that thus the first and most severe act of the alveolar operation has anyhow to be performed.

The near future will probably teach us more precise indications for the selection of the best method in each individual case. I have, so far, been satisfied enough with the results of the alveolar operation. One point regarding treatment in which further improvement would be most urgently desirable is, as mentioned before, curtailment of the after treatment. In very obstinate cases in which, in spite of long continued fluid or dry antiseptic injections through an alveolus no cure results, I shall in future probably only establish a large opening above the canine tooth, and plug the cavity with iodoform

gauze, as suggested by Schech, or make an additional opening in the lower meatus of the nose, as recently proposed by Michelson and Mikulicz.

I should have liked to enter in greater detail upon a good many points which I have barely touched upon, but my paper has, I fear, already attained an excessive length. It will have served its purpose if it has succeeded in drawing attention to some of the most contested points in the etiology, diagnosis and treatment of empyema of the antrum, and in possibly indirectly assisting in paving the way for improvements in these respects.

BIBLIOGRAPHY.

1886.

C. STOERK.—“Ueber die locale Behandlung des Empyems der Highmorshöle.”—*Wiener Med. Wochenschrift* No. 43, 1886; *Tageblatt der deutschen Naturforscherversammlung zu Berlin*, 1886.

MIKULICZ.—“Zur operativen Behandlung des Empyems der Highmorshöhle.”—*Vortrag am XIV. Congresse der deutschen Gesellschaft für Chirurgie in Berlin*, am 10 April, 1886; *Zeitschrift für Heilkunde*, Bd. III., Heft. IV., *Archiv. für Klin. Chirurgie*, Bd. 34. Heft. 3.

ZIEM.—“Ueber Bedeutung und Behandlung der Naseneiterungen.”—*Monatsschrift für Ohrenheilkunde, etc.*, Nos. 2, 3, 4, 1886.

1887.

FLETCHER INGALS.—“Suppurative Inflammation of the Antrum.” *Journal of the American Medical Association*, July 30, 1887.

SCHIFFERS.—“Du traitement du catarrhe du sinus maxillaire.”—*Revue Mensuelle de Laryngologie, etc.*, No. 6, 1886.

B. FRÄNKEL.—“Ueber das Empyem der Oberkieferhöhle.”—*Berliner klin. Wochenschrift*, No. 16, 1887; *Discussion, ibid.*, No. 13; *Vgl. a., ibid.*, 1889; No. 16.

1888.

A. BRONNER.—“The Local Treatment of Empyema of the Maxillary Sinus.”—*The Lancet*, August, 1888.

WALB.—“Erfahrungen auf dem Gebiete, der Nasen-und Rachenkrankheiten.”—*Bonn*, 1888.

E. SCHMIEGELOW.—“Det purulente Nasenflod, etc.”—*Hospitals, Tidende*, Februar, 1888.

ZIEM.—“Ueber das zweckmässigste Verfahren zur Eröffnung der Kieferhöhle.”—*Therapeutische Monatshefte* 4, 1888.

LINK.—“Przycynski Kazuistyczne, etc.”—*Przegląd lekarski*, Nro. 5, 1888; *u. Wiener Med. Wochenschrift*, No. 31, 1888.

P. M'BRIDE.—“Empyema of the Superior Maxillary Antrum, with only Nasal Symptoms.”—*Edinburgh Medical Joarnal*, April, 1888.

KRIEG.—“Ueber Empyem des Antrum Highmori.”—*Medicin. Correspondenzblatt des Württemberg-ärztl., Landesvereins*, Nos. 34 & 35, 1888.

TORNWALDT.—“Ueber die explorative Eröffnung der Kieferhöhle,” etc.—*Tageblatt der 61 Naturforscherversammlung zu Köln*, 1888.

MORITZ SCHMIDT.—“Zur Diagnose und Behandlung der Erkrankungen des Antrum Highmori.”—*Berlin klin Wochenschrift*, 1888, No. 50.

1889.

L. BAYER.—“Beitrag zum Studium und zur Behandlung des Empyems der Highmorshöhle.”—*Deutsche Medicin. Wochenschrift*, No. 10, 1889.

MICHELSON.—“Zur Diagnose und Therapie des Empyems der Highmorshöhle.”—*Berliner Klin. Wochenschrift*, No. 32, 1889.

T. HERYNG.—“Die electrische Durchleuchtung der Highmorshöhle bei Empyem.”—*Berliner Klin. Wochenschrift*, Nos. 35, 36, 1889.

A. FRIEDLÄNDER.—“Zur Therapie des Empyema antri Highmori.”—*Berliner Klin. Wochenschrift*, No. 37, 1889.

TH. SCHECH.—“Die Krankheiten der Mundhöhle, des Rachens und der Nase.”—*Dritte Auflage*, 1889: *Deuticke, Leipzig u. Wien*.

GREVILLE MACDONALD.—“On Empyema of the Maxillary Sinus, with an Analysis of Fifteen Cases.”—*British Medical Journal*, Sept. 14, 1889.

A PARTIAL CONSIDERATION OF CEMENT WORK AND SOME NON-SCIENTIFIC EXPERIMENTS THEREIN.

BY CHAS. B. ATKINSON, D.D.S., New York.

IN the *manipulation* of cements, as of plaster, lies almost more elements of success in producing a dense crystallization than in the materials entering into their composition.

Certain laws must be fulfilled in offering materials to each other for crystallization, but a wide range of action seems to pertain to those crystallizable materials used by dentists, depending largely on the respective quantities of liquid and powder used, but more on the thoroughness with which the materials are mixed.

The writer has had most satisfaction in the results obtained after mixing cements—and plaster—quite thin (perhaps milk is an uncertain simile, but a more uniform liquid as ordinarily met with does not come to mind) and manipulating until a sufficient stiffness results for the purpose in hand.

In the use of Dr. J. H. Smith's Adamantine Cement (oxy-phosphate) in all of the experiments hereafter mentioned, and in the use of the same cement without any addition of other materials, a very satisfactory condition has been induced by kneading between the fingers a pellet of sufficient size to slightly more than fill the cavity or space it is desired to close, continuing this treatment until a satisfactory degree of plasticity is secured. This is particularly gratifying when

the mixtures are used, and gives very extended control over this material, making it possible to do almost anything with it.

The thinly mixed preparations require a longer time to set, counting from the separate materials to their becoming hard after mixing, but the wide range of time possible, after familiarity with the named circumstances is gained, broadens the field for cement work and lifts it to a more durable position than seems to be generally accorded to this variety of plastic fillings. The pellet may be kneaded until quite resistant and then placed in the cavity and finished, requiring only a few minutes of work in the mouth.

The experiments which are here noted were suggested by the unpremeditated admixture *throughout* the oxyphosphate filling, of the agent usually employed in pulp treatment, viz. : creosote and oil of cloves, equal parts.

(The purpose in capping an exposed pulp having been to combine the remedial agent with a portion of oxide and cover with oxyphosphate.)

The resultant crystallization proved so hard that attention was directed to the possibility of using essential oils in mixing cements. Thus far a nearly uniform research has been attained, as to time of setting and consistency, in the admixture of the following : creosote pure ; creosote and oil of cloves, half and half ; carbolic acid, deliquesced ; oil of cloves ; oil of cinnamon and eugenol. The quantity of the above substances used in each instance was about equal to the bulk of the acid required. The oxide and remedial agent were thoroughly admixed and then the acid added and all thoroughly incorporated. These mixtures set hard in about ten minutes but remain resistingly plastic long enough to handle them in difficult cases.

The control that may be had of oxyphosphate cement by proper attention to a variety of proportions in which it combines and especially an added toughness, prolonged plasticity and increased resultant hardness and resistance to solution brought to it in the admixtures named, promises in most cases, more for cement than the appellation "temporary," which it often justly bears. It is not too certain that *gold* fillings have proved more permanent as compared with cement. This does not say that a *proper* operation with gold does not endorse itself as beyond anything before the profession.

These mixtures are believed to be advantageous because of their antiseptic character being continuous throughout—

because greater durability seems to be indicated in most cases over plain oxyphosphate—because the essential oils seem to modify the crystallization and induce a variable condition of plasticity, more controllable than heretofore, permitting an extensive surface to be covered or a complicated bridge to be set with less anxiety and hurry than is ordinarily observed in such operations.

A series of specimens with specific data is presented with these notes. The experiments have extended over a period of eight months. The creosote and oil of cloves mixture has been quite extensively used and has proved itself reliable in capping, placing non-conductors and setting crowns, bridges and retaining fixtures in pyorrhœa cases.

In finishing cements, eucalyptol will be found an acceptable lubricant, pleasant to taste and smell, antiseptic and a gentle stimulant to the gums. Its use permits trimming down of the filling while still plastic, leaving a polished moulded surface. In some cases a coat of sandarac varnish increases the durability of these fillings by immediately sealing the margins. Platinum plate properly formed and having studs or loops soldered inside, and placed on grinding surfaces brings cement filling properly among permanent operations. This opens the subject of inlays which have been variously and ably considered by several writers.

IMPLANTATION OF TEETH.

By G. CUNNINGHAM, M.A., Cantab., L.D.S., D.M.D., Harv.

(Concluded from page 1104.)

CASE XI. was that of A. E. M., a medical student, aged nineteen, whose teeth were in an excellent condition but for the remains of two small roots of the left lower first molar. On November 13th, 1888, these were extracted, the two cavities furnishing a guide for the direction of the new sockets which were enlarged there and then. The gum was healthy, and the condition of the operating field thoroughly satisfactory. The scion tooth was one which had been extracted on the previous day by Mr. Baldwin for the relief of an irregularity.

It was sound and healthy, and had been kept in the usual solution (Hg Cl_2 1 in 2000), although the greater part of the roots were covered with periosteum, one or two places were stripped quite bare, notably the entire lingual surface of both roots. The operation proved fairly simple, and was so well adjusted to the shape of the scion tooth that the support of neither splint nor ligature was deemed necessary. No further treatment was necessary, the parts quickly healed, and on examination of the case, on May 22nd, 1889, I found the gum healthy and well attached, but the roots exposed as far as the bifurcation on the lingual side. The tooth was then quite firm, and had given rise to no trouble.

CASE XII. was interesting, if only from the fact that the past history of the tooth replaced proved that there are other dental operations which sometimes result in as rapid failure and in as serious results as that of implantation. This patient, B. B. H., a healthy undergraduate, then aged twenty and a-half years, had had the carious crown of the left upper lateral incisor excised and a pivot tooth adjusted on the root in February, 1887, by a London practitioner. In November, 1889, I found that the tooth was loose and carious, and had given rise to a chronic abscess, with considerable swelling on the palate.

After extraction of the root, probing demonstrated the existence of a very considerable cavity in the bone, at the apex of the root, and arching towards the palate. The socket was dressed with styptic colloid until the following day (Nov. 17th, 1889), when it was enlarged and burred in its fullest extent. The scion tooth was that of a healthy undergraduate, aged seventeen, but from a twist in the root it was considerably stripped of its periosteum in extraction. The mesial surface was almost bare, while only patches were visible on two-thirds of the labial and on one-third of the distal surfaces. No special preparation was made, nor were any special antiseptic precautions taken, beyond those of scrupulous cleanliness. Half an hour elapsed between extraction and implantation. It was fixed with a ribbon metal splint and phosphate cement. In about a fortnight (sixteen days) the splint was removed and the tooth disked to a more suitable shape. It was then fairly firm and all signs of the abscess had disappeared. I have not seen the case since, but on August 8th, 1889, the patient writes that it is as firm as any of his other teeth.

“CASE XIII. was that of P.W., aged nineteen, a healthy young dental assistant. Some five or six years previously he

had his upper central severely fractured, and after some ineffectual pulp treatment, the roots finally removed. Evidently the small partial denture he was then wearing had not been inserted for some time subsequent to these extractions, since the space between the laterals was considerably contracted. The gum was quite healthy and the condition of the operating field thoroughly satisfactory, except for the fact that the alveolar process was extremely thin, principally from absorption anteriorly. Notwithstanding the fact that he had assisted at most of these implantations, he was extremely desirous of undergoing the operation in his turn. We had long been on the look-out for two suitable teeth when one afternoon, just as I was on the eve of leaving for London, my colleague, Mr. Jones, brought in two upper lateral incisors, which very nearly filled up the intervening space between the patient's own lateral incisors. The scion teeth were extracted from the mouth of a healthy boy, aged twelve, on Dec. 8th, 1888, at three o'clock. Within twenty minutes of our decision that these teeth would suit the case, and within one hour of the extraction the two artificial sockets had been made and the two teeth successfully implanted therein. The teeth were ligatured with silk; and the wound healed fairly firm and rapidly. The pulps of the teeth had not been removed, which did not prevent the teeth in a short time becoming firm without any change of colour. About two months afterwards the teeth began to loosen, and on February 11th, 1889, examination showed that the right upper central was extremely loose, while a fistulous opening had formed on the palatal central ruga. This fistulous opening was evidently caused by this incisor, as the crown could be distinctly moved by pressure with a stiff probe through the fistula. The left upper central incisor was looser than formerly, yet still relatively firm. After adjusting the rubber dam, the pulp cavities in both teeth were opened. The lower parts of the pulp seemed to have undergone a kind of liquid degeneration, while the upper parts, from their bloody condition, afforded evidence of the vascularity of the pulp. There were only slight traces of putridity.

There was absolutely no trace of sensibility in the pulps. After their removal the roots were treated in the usual way, syringed with one per cent. solution of mercuric chloride, filled with zinc oxychloride, and the crowns with phosphate cement. No distinct discolouration of the dentine was visible. During this operation the right upper central suddenly turned

with the drill, showing that the attachment had been broken, and on pressure the tooth made a considerable excursion upwards. After removal of the rubber dam, I found I could remove it quite easily with the fingers. The upper half of the root was absorbed to a considerable extent while the lower half was smooth and seemed devoid of a pericementum. The socket was syringed out with a one per cent. solution of mercuric chloride, also with peroxide of hydrogen (10 vol.). The tooth was then replaced and secured by means of waxed silk ligatures. In a few days the teeth were much firmer, but have never yet become so firm as they formerly were. The patient reported (July 24th, 1889) to my brother that they are still in position.

CASE XIV. is somewhat peculiar. It was that of O. P., a young, healthy Cambridge graduate, aged twenty-two. He had consulted me specially about an extreme and disfiguring irregularity of his front teeth. He objected entirely to any method of regulation which would entail the wearing of plates for any length of time. The deformity in the upper jaw was treated by luxation. We determined to treat the deformity in the lower jaw by the extraction of the left lower canine and the forcible luxation of the left lower central. In consequence of the canine being entirely out of the arch, and the crowded position of the lateral and first bicuspid, it was impossible to apply the forceps in the usual way. After some difficulty it was, however, successfully removed. Then, in endeavouring to luxate the lateral into position, it suddenly "leapt" out under the pressure of the forceps. The tooth was placed nearly at right angles from its normal axis, and on examination it was found that the root was long, tapering and twisted. It was then deemed better to drill out the inter-alveolar septum in order to form a socket for the tooth which seemed best adapted to the situation. This proved to be not the lateral, but the canine. In consequence of the great length of the root the process was extremely tedious, difficult, as well as very painful to an extremely nervous patient. In a part of the operation the patient caused the instrument to swerve, which resulted in a perforation of the alveolus and the gum posteriorly about the level of the frenum of the tongue. The wound was dressed with styptic colloid, and the formation of the socket completed, when the lower canine was successfully implanted and ligatured with silk. On August 12th, 1889, the patient writes to say that though

he has worn the splint over six months the tooth is not firm and has "lost its colour."

CASE XV., that of N. A. G., a medical student, aged twenty-nine, and for whom several teeth were implanted. On December 13th, 1888, I extracted a very badly-decayed broken-down molar from the right side, the roots coming away separately, otherwise the condition of the operating field was quite healthy. The scion tooth was then extracted from the mouth of a young girl, aged fifteen, for the relief of an irregular denture. On examination the scion roots proved to be just about twice the length of the extracted roots, while owing to the great curvature of the roots, they were stripped quite bare of pericementum in large places in the course of extraction. The operation of drilling the socket, especially that for the mesial root, was extremely difficult, principally from the fact that the operation had to be performed with a straight instrument. In consequence of the bulging shape of the scion tooth, it was necessary to disc the crown very considerably before it could enter the space. A small crown cavity and adjoining fissures were filled with amalgam, but the pulp was not removed. In consequence of the curve in the roots the socket had to be made rather unusually large, and, when removing the tooth at one of its final trials, it was seen that the blood mixed with the fresh debris of bone had formed a kind of stiffish paste, which seemed to have taken an exact impression of the roots of the scion tooth, showing a complete septum between the alveoli. It was determined not to syringe the socket out, the idea being that such a matrix must necessarily contain a considerable number of live bone-cells, and therefore be likely to form under favourable conditions new bone around the roots, this suggestion being based upon Dr. McEwen's experimental researches on bone implantation. The tooth had been kept moist in warm water only, and throughout the operation no special antiseptic precautions were taken beyond those of absolute cleanliness, the reason for that course of action being based upon the fact that it is not at all impossible that the drugs such as mercuric chloride and others, which are employed to prevent the advent or connection of micro-organisms, may be extremely detrimental, if not fatal, to the cellular life of the pericementum of the scion tooth. Since such an admission of wilful neglect of all possible antiseptic precautions may expose me to the adverse criticism of the advocates of strict Listerism, I may be permitted to mention two facts—firstly, that despite the numerous organisms

found in the human mouth, any wound in the same is usually characterised by its healing more rapidly than in other parts of the body ; and, secondly, that it is absolutely impossible to maintain strict antiseptic conditions in a case of an implanted tooth subsequent to the operation.

The tooth seemed to fit fairly firmly in position, therefore no splint or ligature was applied, but the edge of the wounded gum was simply dressed with styptic calloid.

About twelve days after the operation the patient remarked an increasing looseness in the tooth for a few days, accompanied also, curiously enough, by a considerable amount of sensitiveness, a condition which he described as becoming chronic for a considerable time.

Eleven days after the operation, Mr. Harrison, who kindly took charge of the case for me, reported that the tooth was very firm—in fact, as tight as any of the neighbouring teeth. There was no pain and the parts very healthy. Within two days, however he noticed a certain looseness, and on the following day found the tooth extremely loose and a little tender.

When I saw the case again, about a month after the operation, the tooth was doing so well that nothing was done, but on his returning at the end of the second month, I found the tooth perfectly loose. I therefore drilled into the tooth and removed the contents of the pulp cavity, which were moist and extremely putrid. The pulp canals were syringed out with 1 per cent. solution (Hg Cl_2) and filled with zinc oxychloride, with copper amalgam filling in the crown.

For this same patient I also undertook the experiment of implanting three contiguous teeth in the upper jaw to replace two broken-down, decayed, bicuspid roots and an absent first molar. On December 17th, 1888, on the extraction of the first bicuspid root, it was found to have a considerable abscessed sac formation contiguous with the thickened periosteum at the apex of the root. The left upper second bicuspid root presented no such formation. On the 19th the patient reported that he noticed yesterday a discharge from the socket or sockets of the extracted roots, and on examination on passing a probe into the second bicuspid socket it was found that it had passed into the antrum. A close examination of the gum over the long-since extracted molar seemed to present indications of the former position of its roots by slight depressions. It seems that about five years previously the crown had been fractured in the process of extraction, and that it

was with great difficulty that the roots were separated and extracted. The tooth specially selected for this case proved unsuitable on trial. The operation was then postponed until the 19th, two days after the extraction, when I was compelled, in default of a better choice, to employ three teeth which I noted at the time as being "not all that could be wished," principally on account of the roots of the bicusps being too long and the roots of the molar too divergent. The periosteum also only seemed to be perfect in parts here and there. The roots of all of them were prepared, as in the other cases, in the holder, and the crowns filled with amalgam. For the three teeth I am indebted to the courtesy of the house surgeon of the National Dental Hospital, but, unfortunately, without any details as to the age, &c., of the patients. Previous to beginning the operation the antrum was syringed with warm salt water. The molar implantation was begun by making a deep crucial incision (St. Andrew's Cross) over the side of the molar; the flaps then produced were then pulled aside. In making the socket over the palatal root the drill, after but a very few turns, suddenly passed into a cavity, evidently that of the antrum. I thought I might have a better chance with the buccal roots, and therefore proceeded to prepare the distal buccal root, but in this region the bone seemed to be even thinner. It was encountered in drilling the mesial buccal socket. In adapting these to the scion roots it was found necessary to enlarge them into one cavity. A considerable difficulty was experienced in getting the molar into position, as either the buccal roots remained outside the alveolus while the palatal root was in position, or the palatal root of the others were in position. Finally, the intervening bone broke away in course of manipulation. This large cavity was then extended until the molar entered, but just as that was being completed a very sudden increased flow of blood took place, with marked pulsation, evidently showing that one of the smaller arteries had been severed. Digital compression failed to arrest the flow, so I endeavoured to force the tooth into its place. Happily, it fitted tightly, and in a short time the hæmorrhage was successfully arrested. In subsequently removing the tooth, to adjust it to the articulation, it was found that a matrix of blood and bone débris had been formed about the roots; this was allowed to remain, and the tooth finally adjusted after a final bath in 1 in 2000 solution of mercuric chloride. The excess of the flaps was trimmed with scissors, and the edges of the wound dressed

with styptic colloid. The antrum was then thoroughly washed out through the bicuspid socket, first with warm water and then with a 1 in 300 solution of mercuric chloride. After enlarging the sockets very considerably the second, and finally the first, bicuspid were adjusted and fixed without very much trouble, except that of adjusting their position and the articulation of their crowns. The second bicuspid was somewhat loose, but was held fairly tightly in position by the crown of the first bicuspid on the completion of the third implantation. In this case the flaps and edges were carefully washed with an antiseptic and dressed with styptic colloid.

The operation was of course a severe one for the patient, and although he was decidedly extremely nervous he stood it remarkably well, although his preparation for the same was about a dram of the extract of coca leaves and about sixty minims of sal volatile. After the operation, on going home, he took ten grains of antipyrin, and a second and smaller dose on going to bed at night. On leaving he had only a sensation of an uneasiness and fulness in the left cheek, and no absolute pain.

With regard to the operation itself, the patient's own account, quoted from the diary of his case, is as follows:—“I did not think the pain very severe, but the nervous strain and irritation very exhausting, and I was quite prostrated by the time the implantation (the molar implantation) was finished. After a rest the two pre-molars were implanted, pain and discomfort being, of course, a good deal less than in the case of the molar.”

The patient passed a fairly good night, in fact much better than the two previous nights, since he felt a considerable pain of a dull kind on the left side of the face for two days after the extraction. Two days after the operation the parts were dressed with styptic colloid, and a disarrangement of the implanted teeth corrected, and a ribbon splint applied which passed round the canine and second molar. The patient reported that he had had no pain, though a slight swelling of the face was noticeable.

On the following day, the 22nd, as the patient was returning to Brighton, I recommended him to place himself in the hands of Mr. Harrison, his former dental attendant, who reports on the case as follows:—“Dec. 24th.—Upper teeth in splint; phosphate cement much cracked and chipped; first bicuspid seems much displaced inwards and upwards. Splint firm, but interferes with bite on lower canine, which

was corrected ; parts generally healthy. Dec. 26th.—Splint broken yesterday ; teeth are very much firmer ; first bicuspid greatly displaced but firm ; articulation of second bicuspid and first molar fairly good and very firm ; fixed new splint with some trouble. Dec. 27th.—Phosphate cement breaking away from splint, therefore removed by patient in consequence thereof ; teeth very firm and generally healthy ; re-fixed splint with phosphate and gutta-percha base plate."

On Jan. 8th patient returned to Cambridge, when old splint was removed. A model was then taken of the parts, and a half round gold wire splint, shaped on a metal die and fashioned somewhat after the style of a Hammond's wire splint, was substituted for the ribbon splint, which is certainly much too thin and frail for so extensive a splint as one including five teeth.

A few days after this the patient complained of a recurrence of a discharge from the left nostril, accompanied by a feeling of fulness, and slight pain of a dull kind.

On Jan. 15th, the upper molar slipped in a little further, coming quite clear of the opposite teeth, which caused some pain and inconvenience for the three or four following days. On Jan. 25th he reported that the discharge from the nostril had ceased. In his letter of that date he expressed a desire to have the molar replaced, but did not feel justified in risking it owing to his early departure for New Zealand.

On Feb. 8th I saw him for the last time. He reported that his health had remained sound, but that he had felt since the operation a general lowering of tone and want of energy, and occasionally a sense of irritation. Being a medical student, and therefore well acquainted with the anatomical relations of the parts, he was more apprehensive as to the possible results of the case than would have been an ordinary patient devoid of that knowledge. His trouble therefore during his last few weeks in this country was more mental than physical, and I trusted that by the time his voyage to New Zealand, which he was then undertaking, was complete, his anxiety would be entirely a thing of the past, as I think there can be no doubt that the period of danger had been successfully passed previous to his departure, even although all of the implanted teeth should be lost.

The patient promised to send me a report on his case for this meeting, but it has not come to hand. His mother writes to say that the delightful voyage has restored her son's health. His letters are cheerful, though he has broken his collar bone.

His only remark about his teeth was one made in May, that they have been a terrible anxiety.

"Case XVI. was that of G. S., a healthy but rather nervous young man, aged twenty-five. This case was a somewhat peculiar one, since although his teeth generally were largely decayed in the ordinary situation of caries, nearly all the front teeth were largely decayed over the whole palatal surface as a result of wearing a cheap (three teeth 12s.6d.) vulcanite plate. He had worn the plate constantly for about four and a-half years, and cleaned it, when it wanted it—namely, about once a month or so. At first he did not remove it so often as that, since he was directed not to take it out at all by the—well we cannot call him dentist, let us say manufacturer. All the surfaces touched by the teeth were considerably affected, but more especially the central incisors, right lateral incisor, and both the canines. The first indication of treatment was evidently the disuse of the plate, to which the patient readily consented despite the deficiency caused by the absence of the left upper lateral. After the numerous fillings had been completed and a healthy condition of the mouth thoroughly restored it was determined to replace the absent lateral by implantation. As his lower incisors were extremely crowded and irregular it was determined to extract the right lower second incisor and to employ that as the scion tooth, which was successfully done on the 11th February, 1889. The condition of the opening field was healthy but very much absorbed; the periosteum seemed to be stripped off in several places. The pulp was not removed, and an interval of barely twenty-five minutes elapsed between the period of its extraction and implantation, and during which time it was kept in clean warm water without the addition of any antiseptic agent. No splint nor ligature was necessary. About five days subsequent to the operation the patient complained of great pain in the implanted tooth; the gum was swollen and inflamed. After applying a 50 per cent. solution of cocaine hydrochlorate to the gum a hypodermic injection was made of antipyrin one grain and nine grains administered internally. This, as was anticipated, led to an immediate increase of the pain; in half-an-hour, however, the patient left with the pain entirely relieved.

On March 7th it was evident that there was an abscess formation at the root of the implanted tooth. This was lanced and the pulp cavity trephined and the pulp removed.

About May 7th the patient noticed the formation of a

fistulous opening on the labial surface of the gum without any pain.

A few days afterwards he consulted me about this, when I found that although there was not much pus on pressure there was a considerable abscessed cavity at the apex of the root. This cavity was thoroughly opened and syringed with Kingzett's solution diluted with peroxide of hydrogen. Two or three similar dressings were subsequently applied, and in August the patient presented himself for examination, when the fistulous opening was found to have completely closed. The tooth at present presents very much the same condition that it has all along, namely, that it is steady but moves on pressure ; it never has presented that rigidity which has characterised most of the other operations.

GENERAL SUMMARY.

1. The operation is still promising.
2. Great absorption of the alveolus, from its necessitating the leaving of but a thin layer of bone on the labial aspect, is a barrier to successful implantation.
3. The pulp should be removed at latest soon after the implantation.
4. The "mortality" seems greatest amongst young scion teeth.
5. It is desirable to ascertain the possibility of the successful implantation of unabsorbable roots which must necessarily be artificial and furnished with sponge grafts or carbolised gut leaders to promote bony attachment.
6. Nothing has as yet occurred to upset or even modify the general conclusions arrived at in the first paper, viz., p. 134.

MATERIALS FOR PLATES.

By PROF. L. P. HASKELL, Chicago.

THE question has been asked, "*What is the best base for artificial teeth?*"

The first point to be considered is, what are the requisites for a material for a base?

1st. A material that will not be effected by the secretions of the mouth.

2nd. A material that will not produce injurious effects upon the tissues of the mouth, or affect the system in any respect.

3rd. A material which has the requisite strength to resist the strain to which artificial dentures are often subjected.

4th. A material which can be manipulated with facility.

5th. A material which can be repaired readily and at a reasonable expense.

I will take the materials commonly used, in the inverse order of value.

First on the list I place *celluloid*, and which, after five years use, trying to convince myself that it was a valuable material, came to the conclusion that it was the worst material ever used for dentures.

My objections are, first, it is a vegetable base, and consequently a non-conductor of heat ; the result of which is, that the membrane is kept in an inflamed condition the more so when the plate adheres well to the palate so that the air cannot circulate under it. The second result of this retention of heat is the disappearance of the process to such an extent as to leave nothing but a ridge of membrane, flabby, pendulous.

The second objection to it is that in many mouths it absorbs the secretions and consequently becomes very offensive. I know it is claimed that where this work is put together by the dry heat process and with metal surfaces, the results are different ; and so they are when first worn, but this effect (which is simply closure of the pores of the material) is soon destroyed by the wearing off of the surface in mastication and cleansing.

The third objection is the difficulty of repair, and the worst feature of this is in the dark line that is formed around the necks of the teeth.

The fourth objection is found in the difficulty of keeping clean. It cannot be done without the use of pumice or other powder, and this wears away the surface ; the wearing of the surface in mastication is such that the heads of the pins are commonly exposed, and I often have seen holes in the plates from the same cause.

Next on the list is *Vulcanised Rubber*.

While I do not consider this material an unmixed evil, it has serious objections, as follows : Like celluloid, being a vegetable base, there is the same objection of non-conductibility, causing inflammation of membrane, and also the other more serious objection of *wasting of process*. This, it should be remembered, is not additional *absorption*, but owing to

the presence of undue heat, the waste material is not replaced as elsewhere in the system.

Also, like celluloid, it is difficult to keep clean, but not to the same extent. Otherwise this material serves a good purpose. Thousands would be unable to afford artificial dentures were it not used. In the attachment of teeth to a gold plate, in full sets or partial lower anterior teeth, I could not dispense with it, for the use of full sets of gum teeth *soldering* to the plate, is far more objectionable.

Next on the list I would place *Silver*. Not coin silver, but pure silver, alloyed with platina, makes a good partial upper, when the patient cannot afford gold. It is not admissible for full sets, as rubber cannot be vulcanized upon it. *Aluminum*, when *cast* by the Carroll process, is undoubtedly a good material, but the swaged plates for general use I do not think are advisable. It is so often the case there is iron in it that holes are eaten through, and it cannot be repaired in case of cracking only by the casting process before mentioned. The casting process is a difficult one, and few have made it a success. The *cast metal* plates (Watt's, Weston's, Reese's) I have used only for lower sets.

While these *metals* are unobjectionable in the mouth so far as I can discover, and securing nice adaptation, my success with them has not been flattering, and I have used the method for several years. There seems to be a yielding of the process and necessity for altering of the margins so long as they are worn, and I have ceased to use them.

Porcelain is an unobjectionable material for plates, but the method of making these plates is such that a long experience is necessary in order to achieve much success, and then it is not possible to secure truly artistic results in the arrangement of teeth and gums and securing correct articulation. Having been familiar with the process ever since its introduction by Dr. Loomis in Boston, having made sets of it, and having seen many cases in wear, I have yet to see one that covers all the requirements of an artificial denture.

Platinum is a metal that is entirely unobjectionable in the mouth and the only one free from alloy. It can be used for full sets with rubber attachments, for partial sets and soldered work, as well as for continuous gum work.

Gold for all purposes, except as a base for continuous gum, is *par excellence* the material for the mouth; for partial sets the best of anything used; for full sets with rubber attachments, next in value to continuous gum.

Last on the list, but first in value, stands continuous gum. It has stood the test for 25 years, the strongest, most durable, most natural in appearance, the most cleanly and healthy of anything worn in the mouth.

I must, however, call attention to the latest "fad," "Ward's Electro Metallic Plates." They are unexcelled in one feature, and that is in producing a perfect fit to the model, and here their merit ends. The metal is deposited by electrolysis, and consequently the plate is *granular* in its structure, and so will never endure the strain to which many dentures, especially partial sets, are submitted, and results in cracking of the plates, breaking off of teeth and clasps. As the inventor says they must never be subjected to a red heat, these breaks cannot be soldered. The only way they can be repaired at all is to solder as you would a tin pan!

Not only this, all these plates I have seen had such an infinitesimal amount of gold deposited upon the silver, that in polishing the rubber attachments, the silver was exposed and the sulphur in the rubber turned the silver black. This work will not stand the test required of an artificial denture.

INAUGURAL ADDRESS.

Delivered before the Odonto-Chirurgical Society of
Scotland.

By JOHN A. BIGGS, L.D.S., *President*.

GENTLEMEN,

After the remarks I made at our last annual meeting, when you did me the honour to confer upon me the office of President of this Society, I need hardly say that I feel proud of the position, and that I have great pleasure in being with you on this occasion in this distinguished capacity, but while thus frankly admitting to you so much, you will, I hope, bear with me while I also confess to you the misgiving I have of my own ability to fill the office creditably to myself, and acceptably to you.

When I think of the roll of honourable and learned men who have filled the chair before me, you will own I have grave grounds for my fears. As you know, your choice fell first upon one whom, I am sure, we should all like to have

seen filling this position, and who needs no praise from me to raise him in your estimation. He has never been sparing of either his time or money in the advancement of his profession in its ethical, practical, political, or its educational interests, and who, I am confident, would have held it with greater acceptance to us all.

You all know how ably Dr. Williamson has recently filled the Presidential chair, and how difficult it will be to bear the record of his attendance, notwithstanding the distance he had to travel, in order to be present, and the able and unbiassed manner in which he took part in the discussions. But I do want credit for something, and that is courage to accept the office just vacated by so worthy a predecessor, and declined by so distinguished a man as Mr. Macgregor. And now that I am in office, I mean to do my best with my poor abilities to maintain the honour and usefulness of this Society, and in whatsoever I may be found wanting, it will not, at least, be in interest in its affairs. How many societies are heralded into existence in the course of a year with a flourish of trumpets, which never see the close of it; but this, The Odonto-Chirurgical Society, has not only survived a great number of years, but has been a power in Scottish dental affairs, having been one, if not the most important, means of banding the best dentists of the country together, and uniting them in a common cause. Before its existence there was a far greater amount of selfishness, petty jealousies, and prejudices rampant. Each man considered himself as good as another and a great deal better. If any important item of practical value came his way he endeavoured to conceal it from his professional brethren, and made what capital he could out of it for his own private interest. He might be a man of a very sociable disposition to all around him, but not so to his fellow-practitioner.

From the same sources as those from which our Society arose, sprang the Edinburgh Dental Hospital, than which I know of no more flourishing institution in the city, nor any more deserving of the liberal support of the citizens, and, compared with the cost of its maintenance, I feel sure it has no equal in relieving pain and giving comfort to the poor. Within its walls there is a staff of about twenty-four doctors and dentists, working together gratuitously for the relief of common humanity, and their kindly smiles and hearts are not reserved for their patients alone, but are there to welcome and to aid each other.

Then, again, we are indebted in the main to members of the Odontological and Odonto-Chirurgical Society for the passing of the Dental Act, giving us registration and the extension of the degrees we now hold ; and then arose the British Dental Association, with all its power of good among us. There are a great many upon the Register still, who are, unfortunately, not a credit of the profession. The public cannot distinguish between such men, as yet, but happily they will soon—not but what there are many good and trusty men who have yet no degree, but they are at liberty to declare their status by becoming members of the B.D.A., and that will be a guide to the public in the near future.

While in Harrogate this year, a lady, knowing my profession, asked me, Is So-and-so a good dentist? I asked, has he a degree? She said no, but he is registered. I said, do you know if he is a member of the British Dental Association? She said, I do not know. I said, if he is, it is a voucher for his standing. If he be not a member, I cannot advise you further about him. The public is also fast finding out that men pretending to do dental work, and yet not daring to call themselves dentists, are not dentists at all, and are not to be trusted, and, no doubt, this is largely due to the publicity given to the transactions of the B.D.A., and to the prosecutions under the Act. Now, gentlemen, if you have followed me, you will see I have been working up to a point in my address, and the point is, that we are largely indebted to this and kindred societies for the elevated platform on which we stand to-day, compared to that of thirty years ago. We must take upon ourselves the responsibilities of maintaining them in full vigour, and to do that, it behoves every member to do his utmost to further its interests, and this may be done in so many ways that it is unnecessary to do more than briefly notice some of them. In the first place, an interest may be shown by the frequency of attendance, for that is the most essential of all, as it is the most discouraging to giving papers, showing specimens, and giving demonstrations to a limited audience. Then every member can, if he choose, give a paper on something or other which will afford food for reflection, and, no doubt, throw light upon his subject that will be useful to many, if not to us all. Some might be inclined to say that they are too busy to take anything like an active part in any society. My experience, however, is that only busy men ever do take an active part in these matters.

Then, again, many men declare they would readily give a

paper, but that our literature is so prolific that it is out of their power to find a subject into which they could throw a sufficiency of originality to warrant them in delivering it. With that excuse I have some sympathy, as it has been my own experience. But where there is a will there is also a way.

Once I was asked to give a paper for a sister society, and declined on those grounds, but, being urged, I said, Give me a subject and I will do my best. A subject was proposed, I accepted, wrote and delivered it, and probably no one derived more benefit from the effort than myself. Now if I may be allowed to suggest a few subjects for papers, I would first indicate anæsthetics, and that notwithstanding that we have had such able and instructive papers and discussions on the matter at Brighton last August. I am prepared to affirm that the subject is one than which no other can possibly be of greater interest, and my favourite mixture, of which I spoke last year—viz., nitrous oxide and chloroform, has not been included in the discussion, and, therefore, the subject has by no means been thrashed out. I would next suggest a paper on implantation as one likely to be interesting, and to lead to a lively discussion. Root-filling is also a good subject. Porcelain fillings might be repeated this year with advantage, and if some of our members would volunteer a demonstration on crown and bridge work, they might reckon with certainty on a large attendance of members.

Are micro-organisms the causes or effect of dental caries? would form a subject of interest for debate. What is the best known treatment for sensitive dentine? But demonstrations are at all times the most popular, and secure the most successful meetings. Cases of irregularity under treatment, and after, are good subjects, but it is useless to suggest. You all have your pet hobbies, and this is the place to trot them out and give them an airing. If I have trespassed upon your time by any detailed suggestions, I trust you will attribute it to my desire to have as flourishing and profitable a session during my term of office as any which preceded it, and, with that explanation I conclude, thanking you all for your patient and indulgent hearing.

British Journal of Dental Science

LONDON, JANUARY 1st, 1890.

FAREWELL AND GREETING.

As we write, the Old Year, 1889, which has been with us for 365 days, sinks into the yesterday of life, and its successor will welcome and be welcomed by our next issue. To all who have emancipated themselves from the happy-go-lucky existence of childhood, and some seem never to do so, the meeting of the old and the new year must suggest grave thoughts. In a paper written in his peculiarly charming style, the prelate who veils his personality under the initials A.K.H.B., which he has called "On Taking in Sail," he sets forth the many benefits which accrue upon setting apart a few hours wherein to hold converse with oneself, and to take stock of one's sayings and doings. To most of us such a time comes at the close of the year, then it is that we have an inclination

"To pause in life's pleasures and count its many tears."

a wholesome and wise proceeding in days of racing railways and telegraphic messages. But every man who is worthy of the name, who is not a mere day labourer, bending his back, and using his hands for the daily wage of food and lodgment, has a double life, the home life, the intercourse with his fellow-men, and again, his professional life. It is with the second part of our readers' lives only that we have to deal. Dentistry may well call a halt and ask itself what has been the net gain or loss during 1889, and the answer need not be waited for long. An eventful year, more perhaps from a political than a scientific standpoint, but taking it in any way

a year of distinct progress. The relations between the medical and dental professions have been far more cordial during the past year, than has obtained before ; at the meetings where 'dentists most do congregate,' the medical profession has attended in greater numbers, and in a more friendly fashion than heretofore ; while at the Odontological Society, a society of dentists for dentists, most of the paper evenings have had the benefit of the lucubrations of some medical luminary. It is matter of congratulation to some minds that not only has this been so, but that the medical press has adopted a wider policy, with regard to dental politics, and has inserted more than one leader upon matters dealing entirely with the dental world, while reports of the meetings, &c., have also found an odd corner in their valuable columns. The Guy's School Dental Department also has brought into touch the medical and dental callings, offering to Students an opportunity of acquiring the whole of their professional training under one roof. Again, the same lines are being pursued by the Royal College of Surgeons, who by recent change of curriculum have to a large extent bridged over the chasm which hitherto has separated the curricula of dental and medical students, while "those who know" are not backward in hinting a still further change in the dental course, and a modification of the career which will make the dentist not only in name, but in fact, a specialised medical student, *i.e.*, one who having studied shoulder by shoulder with his medical confreres has ultimately by passing a special examination (the L.D.S.) become a specialist in dental surgery. Many deplore what they regard as the medicalising of dentistry and advance the time-honoured protest against the student "wasting his valuable time" on dental studies, but there seems reason to believe that provided dentistry is not merged in the medical profession, that the extra time spent during the student-stage will not be to the detriment of the individual. Most boys entering the dental workshop as an apprentice are but ill grounded in general knowledge, and to these the enforced study of medicine and surgery will at least tend to promote.

habits of study and ensure some culture. If we are saying farewell to the old order of things, we may at least hope that the new *regime* will prove a betterment alike for the individual and the community at large.

DENTAL HOSPITAL OF LONDON ATHLETIC CLUB.—The Second Smoking Concert of the season was held at the Mona Hotel, Covent Garden, on Monday, December 16th, the chair being occupied by Dr. Dudley Buxton. A lengthy and interesting programme was arranged, and the evening proved, as anticipated, to be a very pleasant one. Amongst the singers, special praise must be given to Mr. Wheatley for two excellent songs, and Mr. Giles, whose comic qualities are certainly very great. Excellent recitations were given by Messrs. Smith and Garcia, the latter's rendering of "Rubenstein's Piano" deserving a special word of praise. The evening terminated by singing the National Anthem, followed by a hearty vote of thanks to the chairman for so kindly presiding.

IODOFORM ODOUR NEURALISED.—One or two drops of creasote or carbolic acid to the ounce of iodoform will effectually deodorise it without the least injury to its remedial properties.

MODE OF TAKING AN ARTICULATING IMPRESSION.—Dr. Spence, writing in *Items of Interest*, says: In taking articulating impressions, desirable results may be obtained by the use of two sheets of mica ("isinglass") placed together in the lump of warm wax to be used for taking the "bite." Each sheet is laid on a flat surface and warm wax pressed on it, and then brought together, the overlapping edges of wax being pressed together, so as to hold the two pieces as one until the whole is in the mouth. But, first, a slip of wood is pushed into the wax from the front, and just a little aside

from the median line, the sheets of mica having had V-shaped spaces cut in them, to permit the stick to penetrate the wax sufficiently to act as a handle, and at the same time to prevent the jaws from closing any more than is desirable. In many cases the width of the bite may be determined by the size of this stick, previously whittled to the width desired. The mass is now placed in the mouth, and the first closure made. The operator will then insert his finger, and, in pressing the wax down against the teeth, also sever the slight connection of the edges of the wax, and then the mouth may open and shut freely, indicating by repeated closures what is the correct relative position of the jaws during occlusion. But should the divided halves not separate freely, a thin spatula may be run between them. Before withdrawing the bite from the mouth, the halves may be fastened together by running a hot instrument into the space left in the wax by the stick of wood. If an excess of wax is used, so as to necessitate the cutting away of some of it to allow the lip to fall into its proper position, one or both halves may be easily removed from the mouth and replaced.

AN EVERTED CROWN.—Dr. Richard Grady, writing to the *Dental Cosmos*, says : September, 1889, I extracted, without fracture, a specimen, which I believe to be unique. The crown, pointing outward, projected into the lip, causing irritation which rendered it proper to remove the tooth. The history of the patient, family and personal, as given by the physician who accompanied him to my office, is this : “ Grandparents on mother’s side both had regular teeth which presented no anomaly, but became carious at an early age. Paternal grandparents had regular teeth which remained sound to an advanced age. Mother’s teeth present no peculiarity ; neither the father’s, which are even and sound. The closest investigation fails to reveal any history of rachitis, struma, or syphilis. The deciduous teeth of the patient were erupted at the usual time and in the usual order, except that the central incisors in the upper jaw preceded those in the lower jaw. There is no history in any peculiarity in their form, size, or

position. When less than seven years old, the patient fell upon the sidewalk and received a blow which loosened a central incisor in the upper jaw. This tooth was subsequently extracted. The incisor of the permanent set did not appear at the usual time. When about fifteen years old, the patient was examined by a dentist, who stated that there was a perfectly formed tooth in the jaw which he believed would grow and fill its regular position. A few months after this the patient noticed a tooth making its way through the gum about an eighth or a quarter of an inch above its normal position. From that time until now—the patient is in his twentieth year—the tooth has continued to grow, causing no inconvenience beyond a protrusion of the upper lip which was easily noticeable. He merely desires to have it observed—

1. That the crown and the root form a right angle.
2. That the root has grown its natural length, proving that calcification went on after the accident.
3. That the serrations are distinctly marked on the cutting edge of the crown.
4. That the crown of the extracted tooth is smaller than the adjoining central incisor.
5. That the divulgence of the crown is such that the whole lingual surface is seen.

ABERNETHY AS AN ADVERTISER.—Advertising doctors are by no means modern developments. The celebrated surgeon Abernethy, and others of his day, were regular advertisers in *The Times*, and even earlier still the announcements of regular physicians were to be met with in the public press. If this statement of the *Hospital Gazette* is not a libel upon a great surgeon, the fact is an addition to the many curious ones which must appear when some modern D'Israeli writes the "Curiosities of Professional Advertising." Of course we are all familiar with certain names which regularly adorn the monthlies, and so keep their reputation simmering in the public stewpan, nor are the outsiders so crazy as to swallow without nasty sneers about 'a guinea payment' when they read how "Dr. and Mrs. So-&-So have returned to town to their residence in Blank Street." The fashionable dailies batten on these people, and the great British public, whom the Coleman

brothers likened to their 'Grandmother's donkey,' takes it in, or laughs at the monstrous absurdity of respectable people stooping to such vulgarian tactics.

LIBERTY OR LICENSE?—The following extract from the *Odontological Journal* an American periodical devoted to the interests of Dentistry, should hardly, we think, have been allowed space in any respectable journal without an editorial comment exposing the absurd fallacy which underlies the statement of the would be flagellant of the Dental profession. A man, who is competent as a dentist, could have no difficulty in becoming recognised by the state as a legalised practitioner, least of all in America. If he refuses to obey his country's laws, whatever his dental abilities may be, he is a criminal, and by all right thinking men worthy of punishment. It is indeed a hard matter to raise a profession if the self-deputed guardians of its status—the press—pass such preposterous stuff without animadversion.—“Doctor, I see by this periodical on your table that a man was prosecuted for simply advertising himself as a dentist, his competency, except from a legal standpoint, being admitted.” “Yes.” “I thot the dental profession boasted of its liberality—made unprecedented claims in that direction.” “Yes.” “Then isn't this pretty small business for a liberal profession to be engaged in?”

PERRY DAVIS' PAIN KILLER.—The following formula for a preparation he has long sold as Pain Destroying Hot Drops, and which cannot be told from Perry Davis' Pain Killer, is given in *Items of Interest* :—

Alkana	...	...	...	1 ounce
Myrrh, powdered	...	...	...	3 „
Guaiac resin	...	...	...	2 „
Camphor	...	...	...	1 „
Tinct. opium	...	...	...	4 „
Capsicum	...	...	...	4 „
Alcohol	...	...	...	2 pints.
Water	...	...	...	2 „

Macerate several days and filter.

A CURIOUS CASE.—Dr. Grafton Munroe communicates the following curious case to the *Cosmos*. The patient, an elderly gentleman in active life,—a druggist,—wished me to extract the lower right third molar, which had been loose and troublesome during the past year, and, though not carious, was very dark in colour, verging upon black at the partially exposed roots. The tooth had antagonists in the upper jaw, and they increased his discomfort by their occlusion. Of the second molar nothing remained but its roots. From the tumefied gums around the third molar there was a slight discharge of pus, such as is observable in cases of Riggs's disease. I extracted the tooth, which surprised me by the great resistance it offered, and by the suddenness of its release, accompanied with a sound like the "pop" of a cork from a bottle. The patient complained of great pain, but left the office upon my assuring him that it would soon subside. The black and foul smelling roots of the tooth were slightly enlarged at the ends, which accounted for the difficulty attending the extraction, but aside from those abnormal appearances there was no reason for an anticipation of what followed. In about an hour the patient returned and exhibited a swelling in his neck, and a white, apparently fibrous mass protruding from the socket of the extracted tooth. The case was such a remarkably curious one that I called in a surgeon, whose office is in the same building with my own, and he was free to admit that he had never seen such a case, and was at a loss to suggest an explanation. The mass more than filled the socket, and could be pressed deep down into the cavity without occasioning pain or the discharge of blood or pus. I tentatively applied a cocaine lotion to the parts, and the patient departed free from pain. After several days it was found that the swelling and the intruder had disappeared as suddenly and surprisingly as they had appeared, the parts had begun to heal, and recovery was rapid, painless, and complete. My consulting friend as physician and surgeon, and for a short time as dentist also, had an experience which enabled him, in agreement with myself, to discriminate the strange intruding mass from the ordinary sac of an alveolar abscess left behind when the tooth was extracted, and in our joint discussions of the case since that time we have been unable to formulate an explanation in anywise satisfactory.

EXCISION OF NERVE IN NEURALGIA.—Dr. Markoe related to the Medical and Surgical Society of New York the case of a clinical patient on whom he operated for *tic douloureux* by the removal of a portion of the inferior dental nerve. The man had suffered during ten years, several attacks annually. During the past two years his sufferings had been almost without cessation, and aggravated occasionally by very severe paroxysms. Section of the supra-orbital nerve had produced little or no effect; the mental nerve had also been divided without relief. The pain had lately become localized in the mental and dental branches—occasionally radiating to upper branches. A removal of a portion of the dental nerve was advised. This operation was performed. The bone was laid bare and chiselled so as to expose the canal of the inferior dental nerve. One inch of the nerve was removed. It seemed congested, and considerably hypertrophied, but microscopic examination did not detect any change of structure. The relief of the pain was almost immediate. He has had but one slight paroxysm of pain since the operation, six weeks ago, and is now well enough to return to his occupation. Dr. Markoe thought the case remarkable for the rapid subsidence of pain after the operation. The sensibility of the jaw is being gradually restored.

A NOVEL TREATMENT FOR ODONTALGIA.—At a recent meeting of the Edinburgh Medico-Chirurgical Society, held November 20th, Professor A. R. Simpson, M.D., President, in the Chair, Dr. George Lestie, of Falkirk, read the notes of cases of Instantaneous Cure of Facial Neuralgia, Odontalgia, and allied Neuroses. He gave the details of thirty or forty cases of facial neuralgia, cephalalgia, odontalgia, etc., which had been cured, in most instances instantaneously, by insufflation of powdered common salt through the anterior nares. The salt was either “snuffed” or blown up the nostrils. He had been unsuccessful in only two cases; both of these were cases of old standing, which had been treated frequently by morphine injections. In one of them incision of the nerve had been practised.

Abstracts of British & Foreign Journals.

DENTAL COSMOS.

ON THE ANTISEPTIC ACTION OF FILLING-MATERIALS.

By W. D. MILLER, PH.D., D.D.S., Berlin.

VERY little attention has been given to the subject of the antiseptic materials for filling cavities of decay; iodoform cement being about the only material which was introduced with this object in view. After insisting upon the importance of filling roots with antiseptic materials, Dr. Miller details his methods of determining the antiseptic action of filling-materials. In applying the first of these methods we proceed as follows: A tube of ordinary nutritive gelatine is infected with a bacterium from the oral cavity, which grows rapidly at room temperature without liquefying the gelatine. The gelatine is then melted, slightly shaken, so as to distribute the fungi equally throughout the solution, and poured upon a horizontal sterilized glass plate, upon which we drop pieces of the filling material or other substance whose antiseptic action we wish to determine. As soon as the gelatine becomes stiff the plate is placed in a damp chamber. A plate prepared in this way, without the addition of any material having an antiseptic action, will become cloudy and opaque in the course of 24 to 48 hours, through the development of innumerable colonies of bacteria. If, however, the pieces of filling-materials which we have dropped upon the plate possess an antiseptic action, the development of the fungi in their neighbourhood will be retarded or altogether prevented, and each piece will appear surrounded by an area of transparent gelatine whose size will depend upon the activity of the antiseptic employed. Most of the filling-materials in use were tested by this method in respect to the antiseptic action, with the result that the only one which possesses such action and retains it for an indefinite time after it has been inserted is copper amalgam. Not only freshly-mixed fillings, but pieces of old, half-worn-out fillings, taken from teeth extracted in the polyclinic of the Dental Institute, and even pieces of

dentine from teeth which had been filled with copper amalgam, invariably manifested a retarding or preventing action upon the growth of bacteria. Of course it must not be inferred from these remarks that a little piece of copper amalgam dropped into a litre of bouillon will keep it from spoiling. Nor would an experiment of this nature be a just test of the antiseptic action of a material used in filling. If the filling prevents the progress of decay in softened dentine under it or in immediate contact with it, and if it retards the progress of fermentation in fine spaces (leakages) between it and the marginal wall, it is doing a great deal toward preventing the recurrence of caries, which another filling not possessing antiseptic properties would not do. Dr. Miller believes that so much is accomplished by copper amalgam. Referring to the question of the shrinkage of copper amalgam Dr. Miller says he meets almost daily with amalgam fillings, not containing copper, which admit of the point of an excavator being inserted between the filling and the margin of the cavity, whereas copper amalgam fillings appear to hug the walls of the cavity perfectly. Elliott, however, found by a very extended series of experiments that copper amalgams do contract, and some of them to a surprising degree. Elliott's results are corroborated by the evidence of J. Boyd Wallis, who claims that the slight contraction is a distinct advantage in the case of soft and sensitive teeth, because of the more speedy formation of the oxide or sulphide, which, being absorbed by the surrounding dentine, protects it from further progress of decay. "Pulps dying under copper amalgam fillings do not so readily decompose, owing to their becoming charged with antiseptic cupric salts." Other materials experimented with by the first method were gold amalgam, oxychloride of zinc (agate cement), oxyphosphate of zinc (Caulk's cement), gutta-percha, gold, tin, and tin-gold." Gold amalgam, freshly mixed, caused a slight retardation in the development of fungi; old pieces had no effect. Oxychloride of zinc fresh, had a very marked action. Pieces which had lain twenty-four hours in saliva and bread lost their antiseptic power. Oxyphosphate of zinc, fresh, had a slight, inconstant action, sometimes none at all. After twenty-four hours' exposure in a mixture of saliva and bread, it showed no action whatever; gutta-percha and tin proved completely inactive. The results obtained with gold were very peculiar and perplexing. Some preparations of gold manifest a decided restraining effect upon the development of bacteria, so that if a

pellet is dropped upon the plate it will after 24 to 48 hours appear surrounded by a perfectly round circle of transparent gelatine, separated from the clouded gelatine by a sharp border. Within this zone the fungi develop very slowly, so that the cloudiness appears much later than on other parts of the plate. The antiseptic action of Packe's pellets was particularly marked. Plugs of the unannealed pellets made in holes bored in wood showed considerable action, even after they had lain for 48 to 72 hours in a mixture of saliva and bread. Also Abbey's soft foil and quarter-century foil showed similar action, but in a somewhat less degree. Other preparations showed varied effects; some had almost or quite none at all. *This action was completely destroyed by annealing the gold beforehand.* Some preparations of sponge gold and platinum gold acted in a similar manner, and even old gold fillings now and then showed considerable antiseptic action. Different explanations suggest themselves, none being satisfactory. Tin-gold was less active than gold alone. He applied this method of testing the antiseptic property of filling-materials to a few other substances; among them to iodoform, which did not have the slightest action in checking the growth of the fungi. II. In order to make a direct test of the action of fillings upon carious dentine or upon the micro-organisms contained in it, we proceed as follows: A number of freshly-extracted teeth which are extensively decayed, not, however, so as to expose the pulp, are cleansed of the remains of food, and only partially excavated, so as to leave a thick layer of carious dentine in each cavity. The cavities are then filled with various substances whose antiseptic action we wish to test, and the teeth placed in a mixture of saliva and bread and kept for three days at a temperature of 30° C. to 40° C. At the end of this time they are taken out, washed in pure water, placed for a moment in sublimate 1-1000, then in a larger quantity of sterilized water to remove the sublimate, after which they are dried with sterilized bibulous paper. We then take the teeth by the root or roots, rest the side of the crown upon a small anvil, and strike a sharp blow upon it with a hammer. The filling flies out, exposing the untouched surface of carious dentine. We now with a sterilized spoon-shaped excavator remove a small piece of the carious dentine and place it upon a previously prepared plate of sterile nutritive agar-agar. The plate is then put away in a moist chamber at or near the temperature of the human body. If now the fungi in the carious

dentine have been killed by the action of the filling material or if the dentine has been so acted upon by the material as itself to become antiseptic, no fungi will develop around it; otherwise we shall find in the course of 48 to 60 hours that the piece of dentine becomes surrounded by a zone of fungous growth of varying extent. In examining the plates, a low power of the microscope should be used in cases where a growth is not visible to the naked eye. Furthermore, a slight cloudiness or precipitate which sometimes forms around pieces impregnated with copper salts must not be mistaken for a fungous growth; and lastly, a development of bud-fungi (yeast-fungi, *Saccharomycetes*), or mould-fungi (*Hyphomycetes*), which is very frequently observed, must not be mistaken for fission-fungi (*Schizomycetes*). The following materials were examined by this method: 1. Copper amalgam (Lippoldt's). Fifteen teeth were treated as described, and the carious dentine examined by culture. In not a single case did a development of bacteria take place. They had either been devitalized or the dentine itself had become antiseptic. In two cases, bud-fungi developed; in one case, mould-fungi. 2. Gold amalgam, ten teeth. In all cases a development of bacteria took place around the dentine, to say nothing of bud and mould-fungi. 3. Oxyphosphate, eight teeth. Result same as with gold amalgam. 4. Oxychloride of zinc, eight teeth. In seven cases a growth of bacteria formed, though very much retarded when compared with the oxyphosphate or gold amalgam. In one case the piece remained sterile. 5. Iodoform powder mixed with phosphate cement, one tooth. Development of fungi unchecked. In another case the floor of the cavity was covered with powdered iodoform and oxyphosphate filled over. Pieces of dentine taken from the cavity after three days and transferred to the culture plate were soon surrounded by a growth of bacteria and bud-fungi. 5. Powdered sulphate of copper incorporated with cement or with gutta-percha, or simply strewn upon the bottom of the cavity before filling, nine teeth. No trace of bacterial growth appeared in any case. From these results he concludes that copper amalgam fillings have an antibacterial influence upon the walls of the cavities containing them, that oxychloride cements have an appreciable though markedly less effect, and that oxyphosphate and gold amalgam are wanting in any such action: that by incorporating certain antiseptics into the mass of the filling we may produce an effect analogous to that of copper amalgam, and Dr. Miller believes that application of

these results these can be made in practice. Personally he has much faith in the preservative properties of copper amalgam fillings. At the cervical margin Dr. Miller puts a layer of copper amalgam, and then fills the rest of the cavity with some other material. In cases of complicated caries extending under the gum and very near the pulp, where phosphate fillings are utterly unreliable, and even combined with gutta-percha often very unsatisfactory, and where it is not considered wise to risk a permanent filling at once, Dr. Miller protects the neck of the tooth by copper amalgam, allowing a very thin layer to extend over the floor of the cavity in order to thoroughly sterilize the dentine and keep it sterile. The remaining part of the cavity is then filled with cement or gutta-percha, with the intention, in case all goes well, of replacing it in some months by a permanent material. The use of antiseptic materials is suggested as especially applicable for capping exposed pulps particularly when they are not in a healthy condition, or contain germs of infection, as well as for covering the floor of the cavity in all cases where the pulp is protected by but a thin layer of dentine, which is very often more or less softened, if not infected with bacteria. For this purpose sulphate of copper, incorporated with gutta-percha or with some soft cement like oxysulphate, would go far to effectually sterilize the thin layer of dentine covering the pulp, and thereby to prevent not only the decomposition of such softened dentine as may have been left over the pulp, but also the infection of the latter, which is very often the case of pulp troubles arising under fillings. The sulphate of copper, however, seriously stains dead teeth in the course of three days, and would probably act with equal rapidity upon living teeth, so that its use would be on that account very much restricted, if not altogether contraindicated. Various substances suggest themselves, which, being incorporated with cement or gutta-percha, might do good service as antiseptic dressings over diseased pulps or over softened dentine; first of all, naturally, the bichloride of mercury. Which of the many available antiseptics, however, is best adapted to the purpose must be determined by further experiments in the laboratory and in practice. The practice of treating exposed pulps, whether healthy or diseased, to a bath of concentrated carbolic acid has been sharply criticised. Dr. Miller suggests that it is desirable to obtain the same antiseptic action if possible without the cauterising effect of a material by carbolic acid.

Manipulative Miscellany.

All new instruments or articles wished to be described under this heading are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

A NEW FORM OF MOUTH MIRROR.

By E. A. TICE.

WE have received for examination a somewhat novel combination of mirrors, which enables any person to closely examine any part of the oral cavity.

To one end of a strong metal bar a mouth mirror of one inch diameter, is attached by a ball and socket joint while to the other end an ordinary mirror four inches in diameter is attached in a similar way. The bar itself, by a telescopic arrangement, is capable of being lengthened to the extent of $1\frac{1}{2}$ inch.

This invention is placed before the public and boasts, as is usual nowadays, of a high sounding name. The instrument, however, may be found useful by the profession, especially to show patients who wish to see fillings when they have been completed, as they can rarely obtain a satisfactory view.

Reports of Societies.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

THE First General Meeting of the Session, 1889-90, was held on the 15th November,—MR. JOHN A. BIGGS, L.D.S., President in the chair.

At the conclusion of the President's address a vote of thanks to Mr. Riggs was proposed by Mr. Andrew Wilson, seconded by Mr. Rees Price, and carried by acclamation.

Mr. Watson brought before the Society an interesting case of motor and sensory paralysis after tooth extraction. The patient, a lady, had two teeth, the second lower bicuspid and first molar, extracted under the influence of nitrous oxide gas. On regaining consciousness she complained of a want of power and feeling in the lip of the side operated on. On examination it was found that a portion of the lip, about the size of a sixpence, in the neighbourhood of the mental foramen, was insensitive and somewhat powerless. The operation was performed last March, and at the present time, November, the part had not quite recovered itself. The accident was a somewhat uncommon one in connection with the removal of teeth so near the anterior portion of the jaw, and had been probably caused by stretching of the inferior dental nerve, which may have been adherent to, or entangled in the roots of one or both of the extracted teeth.

Mr. Campbell shewed the model of a case of lupus of the soft and hard palates. The disease had removed all the palatal portion of the superior maxilla, the palatal bones, and most of the vomer ethmoid. All that was left of the upper jaw was a portion of the alveolar process holding the six front teeth in position, the three molars on the right, and the last two molars on the left side. The roots of the molar teeth were very much denuded on the lingual side, but not at all on the buccal. The bicuspids were gone—in their place was a deep chasm.

Mr. Campbell supplied the defect with a hard vulcanite plate, which answers the purpose very well, and improves the man's speech greatly.

He also showed a model of a case where he had removed an upper central incisor, beneath which was an unerupted canine, which he also extracted. The patient was above forty years of age.

The peculiarity of this latter tooth was in the fact that, although beyond external influences, there was a cavity on the cutting edge. On examination the pulp was found to be in a very septic condition.

Mr. Watson—In regard to Mr. Campbell's case of impacted canine with deep penetrating cavity at the apex of the cusp, having had an opportunity of examining it carefully, I conclude that there has been a deep fissure at this point, and

that the relation of the tooth to the central incisor has caused the development of odonto-clast cells (some of which are still seen at the margins of the cavity in the canine), which have proved destructive to the faulty enamel, and eventually to the pulp, on the death of which the swelling and tenderness ensued. The case is very interesting and unique.

Mr. Page :—

During my extraction of a number of teeth for a powerfully built German gentleman, on grasping the right superior wisdom, I felt the tooth and its bony surroundings loosen. I immediately desisted, and on the patient recovering from the nitrous oxide anæsthesia, I had the disagreeable duty of informing him one of his offending members had not been extracted. Though persistent in his appeals to get me to extract the tooth, I merely left well alone, only painting with a weak solution of aconite and iodine, and requesting his attendance in a day or two. Several visits were made, and each one found the patient more persistent in his wish to have the tooth extracted—it being slightly painful to the touch, and so somewhat interfering with pleasurable mastication. Otherwise, the parts quite healthy, and the fracture, at the end of three weeks, felt tolerably firm. At this time, in deference to the wish of my patient, I reluctantly extracted the tooth, and, in doing so, brought away the tuberosity, and the floor of the antrum immediately above the tooth. The patient at once presented an alarming appearance of syncope, blood flowing from mouth and nostril, features livid, and breathing slow. Restoratives were at once successfully applied, and the bleeding controlled, firstly, with ice, and secondly, with hot Fletcher's carbolised resin plugged into the wound. In an hour the patient left for home, with instructions to sleep in a sitting posture, and to apply ice should hæmorrhage occur. I anxiously awaited his return next day, and was pleased to hear no bleeding occurred, no fluid passed into the antrum, and altogether he had felt little inconvenience.

Removing the greater part of the plug, a plaster impression was taken, and a black rubber case made, covering well the mucous membrane representing the tuberosity. Previous, however, to insertion the plug was removed, the cavity well washed with an antiseptic solution, and the wounded edges pared and brought together—not however, in their entirety—an opening being left for drainage purposes. The wound

was frequently washed with diluted carbolic acid, and the necessity of wearing the case impressed upon the patient.

A week after the tooth extraction, on passing a barbless Donaldson's bristle into the wound, resistance was felt, and, on wounding, a healthy-looking serous fluid, latterly tinged with blood, flowed from the cavity. Fluids then passed readily into the antrum.

To-day—eleven days after the operation—on removing the denture, no fluid would pass readily into the antrum, and the wound had every appearance of health, and to the criticism of the subject I look for the prognosis of the case.

The fractured tuberosity embracing the roots of the wisdom tooth was exhibited. The cavity of the antrum had evidently passed further back into the substance of the maxilla than was usual, hollowing out the tuberosity to an extent which made its attachment to the body of the bone insecure, and liable to fracture on the application of any force.

Mr. Macgregor exhibited and presented to the museum the model of a lower jaw containing five incisors. Comment was made upon the comparative rarity of the specimen, but doubts were expressed as to whether it was actually as uncommon as it would appear to be, as if an extra incisor were to be erupted it would probably be removed almost at once, on the score of crowding, or it might even be extracted in mistake for a temporary tooth that had not been shed in due course.

Mr. Campbell described the method he had adopted for making rubber bands for regulating purposes. He had been dissatisfied with those usually supplied for the purpose, as they so quickly lost their elasticity, due, he imagined, to the rubber from which they were made being adulterated. With different sized punches, such as those used by workers in leather, he cut out rings from rubberdam, using larger or smaller rings, and thick or thin rubber, according to the case for which they were required. He found they retained their elasticity well, and were far more serviceable.

The President announced that the next meeting would be held on Thursday, the 12th December, when Mr. Wilson had promised a paper on "The First Premolar in the Typical Dentition of the Placental Mammals."

Dental News.

APPOINTMENT.

Dr. H. Fielden Briggs, D.D.S., (Mich), L.D.S., has been elected House Surgeon to the Liverpool Dental Hospital.

Hospital Reports.

MONTHLY STATEMENT of operations performed at the Dental Hospital of London, during October, 1889:—

Extractions	Children under 14	.	.	.	.	.	477
	Adults	.	.	.	.	.	982
	Under Nitrous Oxide	.	.	.	.	.	1063
Gold Fillings.	.	.	.	.	.	.	510
Other Fillings	.	.	.	.	.	.	1459
Advice and Irregularities	.	.	.	.	.	.	179
Miscellaneous	.	.	.	.	.	.	533
Total							5203

A. H. SMITH,	}	<i>House Surgeons.</i>
A. R. COLYER,		
F. C. PORTER,		

Work done at the Victoria Dental Hospital of Manchester, during the month of October, 1889.

Number of patients attended							1120
Extractions	{	Children under 14 . . . . .	. . . . .	. . . . .	. . . . .	}	805
		Adults . . . . .	. . . . .	. . . . .	. . . . .
		Under Nitrous Oxide. . . . .	. . . . .	. . . . .	. . . . .
Gold Stoppings . . . . .		. . . . .	. . . . .	. . . . .	. . . . .		35
Other Stoppings . . . . .		. . . . .	. . . . .	. . . . .	. . . . .		93
Miscellaneous . . . . .		. . . . .	. . . . .	. . . . .	. . . . .		450
Total							1518

CHARLES H. SMALE, *House Surgeon.*

Work done at the Birmingham Dental Hospital, 73, Newhall Street, during the month of October, 1889:—

Males	123
Females	186
Children under ten years of age	135
Extractions	452
Gold Fillings	10
Other Fillings	75
Advice	87
Anæsthetics administered	21

FRED. R. HOWARD, *House Surgeon.*

STATEMENT of operations performed at the National Dental Hospital, from September 30th to October 31st, 1889:—

Number of patients attended	1982
Extractions { Children under 14	333
{ Adults	540
{ Under Nitrous Oxide	858
Gold Stoppings	96
Other Stoppings	397
Advice and Scaling	487
Irregularities of the Teeth	71
Miscellaneous	156
Total	2938

EDGAR A. H. FIELD, }
 HORACE H. ELLIOT, } *House Surgeons.*
 FRED. A. HUET, }

ERRATA.

Page 1066 line 27 Mr. W. A. Hooton, L.D.S., Eng., also has the following qualifications M.R.C.S. & L.R.C.P.

„ 1067 line 35 Read *smaller* instead of *small*.

„ „ „ 41 „ *quantity* „ *quality*.

„ „ „ 42 „ *be safely injected* „ *safely inject*.

Mr. Simms instead of Mr. Sims.

British Journal of Dental Science.

No. 528. LONDON, JAN. 15, 1890. VOL. XXXIII.

TOOTH EXTRACTION AND ITS ALTERNATIVES FOR THE RELIEF OF PAIN.

By H. C. QUINBY, L.D.S.I., President of the Midland Branch
of the British Dental Association.

THE following remarks are intended as an earnest remonstrance against the practice of extracting teeth for the mere relief from pain, a practice which those country surgeons who are, by reason of distance from special dental aid, compelled to pay attention to the teeth of their patients seem to think is the only possible form of treatment, and therefore perfectly justifiable. I am aware that many who call themselves dentists are guilty of a still more extravagant waste of human teeth; often, I fear, prompted by a motive of self-interest, which ought to be a sufficient reason for striking their names off the Register; but, while an appeal to these men—if, indeed, any appeal would influence them—would be more in place in the pages of the dental journals, those special journals do not, as a rule, come into the hands of general practitioners in medicine and surgery.* I constantly hear of cases like this. “I got toothache while I was staying at such or such a place, and, as there was no dentist near, I went to the doctor, and he took the tooth out.” There is never any mention of an effort to save the tooth, and in these days, when surgery is making such rapid advancement in every direction, it is time that such empiricism should come to an end. I doubt if there is any other organ possessing a tithe of the functional importance to the maintenance of human health and strength that rightfully belongs to a grinding tooth which would not receive far more consideration if it were a source of pain than any surgeon ever thinks of giving to a tooth.

When a tooth aches, the first suggestion is to have it out. But I do not hesitate to say, after many years of experience, that it is never necessary to extract a tooth merely for the relief of pain. That there may be, and are, many other

* This refers to the *Lancet* in which the present paper is reported.

reasons of sufficient importance to justify extraction I of course admit, and these should have proper consideration in cases of toothache : but what I mean to say is simply this : there are two forms of pain arising from teeth, which will include at least 90 per cent. of all the cases that will come to a dentist in good practice ; we will call these primary and secondary toothache, and I contend that in neither of these is extraction ever the remedy to be chosen without careful deliberation.

Primary toothache is congestion of the tooth pulp ; the unyielding walls of the pulp cavity permitting no expansion, there is intense pressure on the nerve tissue, and consequent pain, which finally terminates by strangulation of the pulp. This is true toothache, arising in the tooth, but it may be felt in the terminals of any of the branches of the fifth nerve, on the corresponding side of the face, and is rarely felt in the tooth where it originates, unless there is suppuration in the pulp, in which case the periodontal membrane will be affected. It will be obvious that many cases of so-called neuralgia in the face are simply toothache, and a careful search will generally reveal the offender, but there will be no occasion for extraction. Careful excavation, sufficient to allow an escape of blood from the pulp, will at once relieve the pain, and an arsenical dressing will devitalize the pulp, and there need not be anything like the pain of extraction. To complete the operation the pulp must be removed from the root canals, and these filled to the apex : but this will call for special skill, and no harm will be done if there should be three or four weeks of delay. Nothing in a dentist's experience is more melancholy than to look into a mouth and see six or eight detached grinding teeth without an antagonising tooth in the opposite jaw.

The secondary form of toothache is usually admitted by the sufferer to be toothache, because the pain appears to be intensified by occlusion with an opposite tooth and by pressure of any kind. In reality the pain is caused by gangrene of the pulp, and I am quite aware that this is considered so serious a matter that most surgeons would order immediate extraction, but it is not at all a necessity. It is a matter of every-day practice with me and with thousands of other dentists to treat alveolar abscess successfully and make the teeth useful and comfortable. There are failures of course, as in everything else, but they are not more than one in ten, and of these half at least are failures only so far as this, that the abscess has

established a sinus, and that for some time after the tooth has been filled there is an occasional discharge of pus from this sinus ; but the cause of the diseased condition is removed, there is little if any pain, and the discharge ceases after a time. The first treatment is a very simple matter. Percussion indicates a diseased condition outside the tooth—that is, in the peridental membrane, and the cause is a decomposing pulp or some other putrescent matter in the pulp cavity. The tooth is generally decayed, so that a very slight excavation will open the pulp cavity and give vent to the poisonous gases and pus which are confined there, and when these find an outlet the pain ceases. Recognising the fact that alveolar abscess does not, and cannot, arise from a tooth which has a healthy pulp, it is obvious that an opening into the pulp cavity will be a painless operation, which, of course, extraction would not be, nor will extraction give relief so quickly as the simple treatment I have suggested. I do not mean to say that the soreness which was felt on pressure will immediately disappear; it will take time for that ; but the intensity of the pain will be mitigated, the contents of the abscess will be evacuated through the roots of the tooth, and very quickly the tooth will be in a condition for further treatment, which will in most cases result in a radical cure of the tendency to abscess, and the tooth will be made useful and comfortable. The course of treatment is a series of antiseptic dressings in the roots to cleanse them from all putrescent matter, and then, as in the other case, filling them to the apex, for while abscess is first caused by toxic matter from the decomposing pulp, it is maintained and renewed by the filling up of the pulp cavity with pus and lymph, which in their turn pass through the same process of decomposition. This root treatment, however, is not available in temporary teeth after the sixth year, as the process of absorption which is going on in the roots of these teeth will have so widened the apical foramina that a solid filling cannot be made, and is therefore worse than useless ; but it is better to open the pulp cavity freely and leave it open, so as to allow free evacuation into the mouth and allow the tooth to decay gradually, as it will of course do, until nothing but the roots remain, than to deprive the child of a masticator at once.

The child needs masticators quite as much as the adult ; but more than this, I am certain that it is almost an impossibility to extract the temporary molar when it is in anything like full development without more or less displacement of the

partially developed bicuspid which lies between the roots of the temporary molar. I am well aware that it has been said over and over again by writers who are recognised as authorities that the development of the alveolus of the bicuspids does not depend on the retention of the temporary teeth ; but what does that matter if the partially calcified crown of the bicuspid is so displaced that the further development goes on with the tooth in a transverse or a horizontal position ? I have in my possession models of the upper and lower jaws of a boy of ten years and a half of age, whose temporary molars and two canines were all taken out while in almost perfect development, and the gums are shrunk like those of an old man, with not the slightest indication of a bicuspid appearing for the next five years. I often see cases where some of the temporary molars have been removed, but I confess I do not often see cases of such wholesale premature extraction.

Alveolar abscess may arise from a putrescent pulp in a tooth which is not decayed at all, but which has some time been displaced by accident so as to sever the nerve and blood-vessels at the apical foramen. This happens, especially with front teeth, from a fall, from a blow, from many chances in athletic games ; and often enough the tooth may be comfortable for months after the accident, so that no one thinks of connecting the present pain with what happened so long ago, but by drilling into the pulp cavity the poisonous gases and the pus are evacuated, and the tooth can be made as useful as the others. In all cases after a front tooth has been loosened by an accident it should be watched carefully for a few months to see if any change of colour takes place, and if so the pulp cavity should be opened at once.

Pyorrhœa alveolaris may cause something very like alveolar abscess, and yet the pulp of the tooth will retain its vitality ; but in this case the disease commences at the neck of the tooth and proceeds towards the apex of the root, which is exactly the reverse of what happens when there is a putrescent pulp. In these cases, although relief will be given by a thorough cleansing of the root, by scraping, and by one or two applications of aromatic sulphuric acid, followed by soothing dressings, there is little chance of saving the tooth for more than a year or two.

In this paper I have only meant to indicate that there are means of relieving the ordinary forms of toothache, which will be far more merciful than extraction, to the patient, and which are so simple that any surgeon can make use of them, and at

least, if he cannot complete the operation, he will have relieved present suffering, and left the tooth to be treated by hands which have had more practice. But I do not by any means pretend to have exhausted the subject, or to have presented anything which will be new to dentists. I am told that surgeons do not learn these things from their text-books, and I hope I have shown them that there is something more interesting about teeth than extracting them.

THE TREATMENT OF PULPLESS TEETH.*

BY D. A. CORMACK.

Mr. President and Gentlemen,

The treatment of pulpless teeth forms so great a part of our daily work that a paper on that subject cannot fail to be of interest.

Owing to the meeting being held an hour later, and to the extraordinary amount of business that we have to get through, I must make my remarks as short as possible.

I regret that I have little that is new to bring before your notice, but, I hope, by running over one or two methods to bring about a long discussion from which we may all gather valuable hints.

I shall touch upon the treatment of exposed pulp, for although a long paper might be written upon that subject alone, yet it approaches the theme of this paper so closely, that I cannot entirely exclude it.

DEATH OF THE PULP.

Pulps may die from a variety of causes, but the most common cause of all is the irritation caused by thermal changes on exposed or nearly exposed pulps. Blows, such as are received in fights, or falls, are responsible for the death of a good many pulps. Occasionally we find teeth untouched by decay which have dead pulps, the pulps having died without having caused any trouble to the patient, until the formation of alveolar abscess, but forgotten violence may be the cause. I may here remind you that the knocking of a child's head against its mother's or its nurse's front teeth is not an infrequent cause of the death of pulps.

*A paper read before the Students' Society, London Dental Hospital.

I need hardly include in this list such pulps as we ourselves destroy by means of escharotics.

The teeth in which pulps have died from natural causes are found to be in a very foul and disgusting condition, the canals generally contain portions of dead pulp, and are themselves saturated with septic fluid. If any septic matter be allowed to remain in a canal after the filling of a tooth, it will generate gas which will make its escape through the apical foramen, and the periosteum will become so much inflamed that, if measures be not taken to ensure its relief, alveolar abscess will result.

It will, therefore, be seen how important it is that all canals should be entirely freed from septic matter.

ENLARGEMENT.

This is best accomplished by first thoroughly opening out the pulp chamber, so that free access may be obtained to all the canals.

Hern's burs should be used for imparting wide funnel-shaped openings to the canals; after this, Gates-Gliddon drills should be passed into the canals for the purpose of removing the softened tissue from the more contracted parts of the canals.

Some operators are opposed to enlargement on the ground that great danger is run of either perforating the canal walls, or of forcing septic matter through the apical foramen.

The first objection is not an invalid one, for if care be not exercised roots may be perforated. This accident has twice happened to me during my training here, and I have met with a few cases amongst the students. Should the perforation take place in the vicinity of the pulp chamber, the wall may be repaired with gutta percha, but generally roots are perforated in the more inaccessible parts, and then extraction is the only course left to the operator.

The danger of forcing septic matter through the apical foramen, is, I think, an imaginary one, for I do not see how it can be possible, except in the teeth of very young patients, and such teeth had better be extracted.

On the other hand, if the canals be enlarged, the antiseptics employed will have free access to all parts of them, and at the same time the most troublesome part of the work is done away with. Again, softened tissue may be removed in less time than would be occupied in rendering them aseptic.

In treating pulpless teeth, care should be taken not to over-

look any supernumerary canals, for if one be left in a septic condition, serious trouble may ensue.

ABNORMALITIES.

Supernumerary roots occur most frequently in molars of the lower jaw, but they also occur in other teeth, notably wisdoms. Bifurcated canines are sometimes met with, and very rarely, bicuspid with three roots.

The anterior roots of first lower molars are always pointing forwards, and have dumb-bell shaped canals.

It will seldom be advisable to attempt to treat pulpless wisdom teeth, for these are generally so inaccessible, and the number of their canals so uncertain, that there is little prospect of any result but failure.

Some wisdom teeth, however, may be made to do good service for many years, but these do not occur in many *English* mouths.

Upper first bicuspid sometimes are very troublesome, but if a Donaldson's bristle can be introduced into the small roots there is little fear of an unfavourable result.

ACCIDENTS.

Gates-Gliddon drills are sometimes broken into the upper ends of root canals, and their removal is a matter of considerable difficulty. Mr. George Seymour invented a pair of forceps for removing broken drills from roots, but I think that they are inapplicable except in a few favourable cases.

During the time that I was working here, I several times failed to remove portions of drills from roots, and filled the canals in the usual way, regardless of their presence. The portions thus left in, do not, I think, act prejudicially to the success of the operations, and they certainly form root-fillings the density of which cannot be surpassed.

I think that a drill will not break in a root unless its head has become imbedded in *hard* dentine, and this probably explains why we so seldom have trouble from a tooth in which a drill has been broken.

Broken drills may sometimes be removed by drilling away the dentine from the impacted portions, but such operations are extremely dangerous, and should be discouraged.

ANTISEPTICS.

After the canal walls have been entirely freed from softened dentine, the use of antiseptics should be commenced ;

those generally employed being iodoform and oil of eucalyptus. They are generally applied by moistening a few fibres of cotton wool, which have been previously wound round a smooth broach, then dipping the broach, with the wool still round it, into iodoform, and then carrying the whole into one of the canals, the broach only being removed. The other canals should be dressed in the same manner, and the cavity sealed with gutta percha. After the dressings have been allowed to remain in a tooth for a week, they should be removed, and fresh ones applied, the cavity being sealed with gutta percha as before. This is a very good method, and it is the one adopted by the majority of conservative dentists, but it is found in practice to take too long, three weeks usually being spent over a single tooth.

Many dentists do not hesitate to extract pulpless teeth that may be causing pain, because they have not the time necessary for their salvation. Other dentists are very willing to undertake the treatment of such teeth, but their patients cannot afford the time. This might be avoided if a more ready method were adopted.

IMMEDIATE ROOT-FILLING.

Although a practice cannot be conducted successfully if only one method be known to the operator, yet I think that the immediate method will generally be found more effective than the method I have just described. Not only may a tooth be treated and permanently filled in less than an hour, but also the teeth filled on this method seem to give fewer failures, provided a proper root-filling be employed.

The rubber-dam must first of all be applied, for without its use the operation cannot be efficiently carried out.

As all canals contain a large quantity of moisture, they should be well washed with absolute alcohol, that drug being carefully worked into each canal with a Donaldson's bristle.

When the alcohol has been allowed to remain in the canals for a few minutes, it should be removed, and peroxide of hydrogen used in its stead. This should be worked into the canals in the same way as the alcohol, and many applications should be made. During the time that the peroxide of hydrogen is in the canals, the cavity will become bleached, and there will be a peculiar frothing of the liquid. Usually twenty minutes will be ample time for the tooth to be submitted to the action of the drug, but its use should not be discontinued until *violent* frothing has ceased.

Hot air, and hot instruments should now be applied to the canals so that the dentine may become quite dry, and capable of absorbing the drug which is next to be applied, viz., perchloride of mercury (1-200). This must be worked into the canals in the same way as the alcohol and peroxide of hydrogen. When it has remained in the canals for a few minutes the canals should be dried with hot air and hot instruments. If the nozzle of an air syringe be held in the flame of a spirit lamp until red-hot, and be maintained in that condition while air is passing into the bulb, the heated air will be much hotter than if the nozzle were simply held near the flame of the lamp. When the dentine of the canals is quite dry, the root-filling should be gone on with.

As regards the success of immediate root-filling I may say that if the canals be thoroughly filled with a mixture of osteo, and beta-naphthol, there is nothing left that could be desired.

When I first tried this method, I tried several kinds of root-fillings without success, but Mr. E. Lloyd Williams recommended the mixture that I have just mentioned, and since then, I do not think that I have had a single failure, certainly I have not extracted a tooth that I have filled with it.

EXPOSED PULP.

In cases of exposed pulp, capping will be found of service only in cases of accidental exposure, and even then it is not universally successful. The operation of extirpation of the pulp is generally a more or less painful one, and capping is often resorted to, to avoid it, but I am not sure that extirpation is not the best practice to adopt in all cases of exposure, whether accidental or otherwise.

Before attempting to extirpate a pulp, an escharotic should be applied to it to deprive it of its vitality. Arsenic is the drug which is generally used for this purpose, and I have never heard of anything that will do the work more rapidly. When arsenic is used, great care should be taken lest any of it get on to the soft tissues in the mouth, for if any should get into the mouth sloughing will be sure to result. A very small quantity of arsenic only should be applied to the pulp, and it should be securely sealed with gutta percha. Two days is the period usually allowed for the arsenic to act, but if a week be allowed the results will be more satisfactory.

It has been said that if arsenic be allowed to remain in a tooth for more than two days it will escape through the foramen in the apex. Now, if a pulp to which arsenic

is applied, dies from strangulation, brought on by acute congestion, blood cannot escape from the canals, and I certainly fail to see how the arsenic can be capable of going through the apical foramen by itself.

Sometimes great difficulty is experienced in devitalising pulps, arsenic having been applied repeatedly without success. As a rule such pulps are found in the teeth of strumous patients, and when arsenic has been unsuccessfully applied, an eschar should be formed with chloride of zinc, or carbolic acid, and then removed, the wounded surface being dressed with arsenic; if on the second visit of the patient the pulp be not dead the process should be repeated.

REMOVAL OF PULP.

The instruments best suited for removing pulps are the barbed nerve extractors supplied by S. S. White & Co., but Donaldson's bristles will be found very useful. After a pulp has been removed there will be a little hæmorrhage, which is easily arrested, and when the canal has been dried root-filling may be gone on with.

ALVEOLAR ABSCESS.

In treating teeth that are abscessed, the knife will be found of great service in getting rid of pus, but if the knife be objected to, hot fomentations should be applied to the gum, and purgatives prescribed, when the swelling will very rapidly subside. Dry dressings of iodoform in the canals will facilitate the reduction of the swelling.

When the gum has returned to its normal condition, the usual root treatment may be gone on with, care being taken that no septic matter be allowed to remain in the canals.

ROOT FILLINGS.

Several substances have been used for root-fillings, the principal being gold, tin, lead, gutta percha, osteo, wood, shellac, the preparation of iodoform, and wax, introduced by the President, and a mixture of osteo, and beta naphthol. Gold, tin, lead, and shellac form perfect fillings when properly introduced, but they are very difficult to manipulate, and more difficult to remove. Wood has, I think, long since gone out of use.

Gutta percha makes, at the time of its insertion, a good filling, but it shrinks badly, and is very absorbent; it is consequently not a desirable root-filling.

Wax, when used alone, very quickly disappears, but iodoform and wax last longer. I have put iodoform and wax into teeth, and on opening the teeth have found the canals empty.

Osteo when used alone hardens too quickly to be manipulated by ordinary operators. The mixture of osteo and beta naphthol does not become quite hard until it has been mixed for two or three hours, it is easy to manipulate, and is powerfully antiseptic.

The naphthol should be taken on a spatula, and dissolved in phosphoric acid, oxide of zinc should be added to form a thin paste. A drop of oil should be placed upon the back of the left hand, and a smooth Donaldson passed through it, all excess of oil being removed. The bristle should now be dipped into the paste, and the walls of one of the canals smeared with it. Some fibres of cotton wool should be wrapped round a clean, smooth bristle, dipped into the paste, and pushed into the canal, the bristle being removed, and the filling in the canal thoroughly condensed. Whenever the immediate method of root treatment is adopted, no other filling should be used.

Gentlemen, I have now come to the end of my short paper, and I trust that you will overlook its numerous shortcomings. I hope that you will join freely in the discussion, for I shall then feel that the object of the paper has been attained.

A CASE OF ANTRAL TUMOUR.*

By E. LLOYD WILLIAMS M.R.C.S. L.R.C.P. L.D.S.
& J. BLAND SUTTON F.R.C.S.

Mr. E. Lloyd Williams reported a very interesting case of antral tumour. The title had been erroneously placed upon the agenda as "A case of Sarcoma of the Upper Jaw," and indeed until after the operation, when the specimen could be dissected and examined, it was believed to belong to that category, whereas it had turned out to be an extremely rare growth involving the orbital nerve, and a myxoma invading the antrum and impinging on the orbital plate. The patient, a woman aged twenty-three, had suffered very severe pain

* This and the succeeding cases were read as Casual Communications, before the Odontological Society of Great Britain.

extending forwards from the region of the upper bicuspid upon the right side. The neuralgic pain involved the teeth and mucous membrane supplied by the anterior dental branch of the superior maxillary division of the fifth, and there was also anæsthesia of the skin supplied by the orbital branch. The neuralgia had lasted for about a year before she was seen by Mr. Lloyd Williams. As the pain was clearly not of dental origin, she was referred to Mr. Bland Sutton, who, believing that she was suffering from sarcoma of the upper jaw, removed the right superior maxilla. As Mr. Bland Sutton was present Mr. Lloyd Williams proposed to leave to him to narrate the clinical features of the case, but he would draw the attention of the members to one or two points of interest. In the first place the case showed how desirable it was not to confine the attention, in cases of severe neuralgia, to the teeth, but to seek for its cause either in the nerves themselves or in the central nervous system. It was a common complaint among dentists that medical men were too apt to neglect the dental origin of neuralgia, and this case showed how important it was for dentists not to fall into a like error and confine their attention solely to the teeth, when called upon to grapple with inveterate neuralgia. And secondly, it was of interest to see how efficiently the portions of the jaws removed in operations like the present one could be replaced by artificial plates. Mr. Schelling, a student at the Hospital, had constructed the apparatus in vulcanite, the thicker portion being hollow—a great advantage in the treatment of these cases, where much of the alveoli was removed. It would be seen by members who examined the patient, who was present for that purpose, that her speech, her mastication, and powers of eating and drinking were rendered almost normal by the contrivance which she wore.

Mr. Lloyd Williams also showed a case of syphilitic perforation of the palate. The patient, a man of about thirty, had contracted syphilis in April, 1887, and in August, 1888, perforation of the hard palate was complete as a result of syphilitic periostitis. The case was remarkable from the very short time which had elapsed between infection and the supervention of periostitis. The patient had applied at the Dental Hospital for relief, on account of the serious inconvenience he suffered through the perforation in his palate, as in smoking, eating, or drinking, smoke, food, and fluids escaped into the nasal cavities. In studying the case, the question arose whether it would be best to assist nature by means of a plate which would cover

in the aperture, or whether such a contrivance would exert deleterious pressure upon the soft parts and so increase the evil. It was decided to adopt the plan of adjusting a carefully fitting obturator, and the result was very interesting, for the aperture had, under the treatment, contracted up, and at the present time showed only a pinhole orifice. The occluding tissue was fibrous in nature and was clearly the result of the protection afforded by the plate. Mr. Lloyd Williams laid great stress upon the importance of ensuring an accurate fit and so avoiding undue pressure around the margins of the aperture. The obturator had, in this case, been executed with much care by Mr. Day, a student of the Hospital, and was shown *in situ* at the meeting.

Mr. J. Bland Sutton said that he proposed to narrate briefly the clinical facts of the first case to which Mr. Lloyd Williams had referred. It was of extreme interest both from the clinical and pathological aspect. The patient complained of the most terrible neuralgia, and had had several teeth removed in the hope of gaining relief. When seen at the Middlesex Hospital it was observed that the right eye was unduly prominent, being also pushed outwards; the globe, also, was painful to pressure. Sensation was carefully tested by means of a pin, and it was found that the area supplied by the infra-orbital nerve was quite anæsthetic. The neuralgia was also worse in the gums and soft parts supplied by that nerve, while areas innervated from other parts of the fifth nerve were found normally sensitive. The neuralgia was so severe that it needed fifteen-grain doses of antipyrin to afford the smallest relief. The evidence thus afforded was deemed sufficient to warrant the diagnosis of antral tumour involving by pressure or otherwise the infra-orbital nerve. After consultation with his surgical colleagues, Mr. Bland Sutton decided to remove the upper jaw, as any measure short of that was considered likely to prove insufficient. The patient being anæsthetised a preliminary laryngotomy was done and the pharynx plugged, a method for which in excision of the jaws Mr. Bland Sutton expressed his strong advocacy, as it removed all anxiety about hæmorrhage entering the lungs. The lip being divided and the cheek reflected a nodular growth came into view, which was seen, when the bone was partially chipped away, to involve the infra-orbital nerve, and to fill the antrum. Mr. Lawson (one of his colleagues present at the operation) urged the removal of the whole upper jaw, which was accordingly done, and Meckel's ganglion coming

into view was destroyed. The eyeball was supported in its place by pads of oiled lint. After removal of the jaw the tumour was found to have no bony attachments. It was covered with mucous membrane clearly that of the antrum, and in structure was found to be a myxoma which had sprung from the inter-tubular structure of the infra-orbital nerve expanding the nervous tissue over it. A careful research had proved it to be an exceptionally rare tumour. Virchow had mentioned it, stating that when a myxoma grew from the intertubular structure of a nerve, it developed quite in the way which had occurred in the case in point, and further stated that when these tumours found their way into cavities they became as a result of anatomical environment lobulated. Mr. Bland Sutton pointed out that the fifth pair of nerves were prone to neuromata, but as far as he knew this was the only recorded case in which a myxoma or neuroma had grown into the antrum. He could not help believing that the cases which must have occurred previously had been overlooked, the growth having been hastily dealt with as a specimen of tumour of the upper jaw, and its precise anatomical relations not fully dissected out.

A SLIDE SECTION TRAY.

By DAVID HEPBURN, L.D.S.

ANYTHING relating to the subject of "impression taking" must always be surrounded with a certain amount of interest from the acknowledged importance of obtaining an accurate representation of the mouth as a first step towards the satisfactory application of any artificial appliance. I therefore venture to trespass upon your time for a few minutes this evening in order to bring before your notice a small novelty in the form of an impression tray, which I have lately devised, and a few specimens of which have been made by Messrs. Ash and Sons from my patterns.

I have called it "the Slide Section Tray," as this title in a measure explains its form and purport. Its object is to lessen the difficulties of plaster impression-taking and to avoid the evils of "dragging" where a plastic modelling material is employed. It consists of two parts, one being very similar (with certain necessary modifications) to an ordinary im-

pression tray, only having the anterior portion of the external rim absent. The second part consists of a slide to which is attached, so to speak, the missing portion of the external rim. This slide works upon the handle, and when pushed into place completes the tray.

In order to explain the use of this instrument I will describe its application in one typical case, say that of an upper jaw with the six front teeth alone standing, these being narrow at their necks, perhaps slightly loose and abnormally projecting. In such a case with the ordinary tray a plaster impression would be dangerous, if possible, to procure, a plastic one would inevitably "drag" by the resistance of the front teeth, and in so doing would probably yield a faulty representation of the palatal region, while of necessity the anterior surfaces of the front teeth, would be entirely sacrificed. The "Slide Section Tray," I think, may tend to overcome these difficulties.

Firstly, in order to take an impression in modelling composition: remove the slide, and having filled the tray with the composition place it in the mouth. Bring it well up to the backs of the teeth and hold it in position until the composition hardens. This may be hastened by syringing with cold water or by applying a wet napkin. The anterior surfaces of the teeth are thus left exposed. Next, having a small roll of composition ready softened, place this on the exposed surfaces of the teeth, apply the slide and pass it home, this will force the roll into all inequalities and complete the impression. In order to remove the impression partially withdraw the slide by means of the finger rests provided for the purpose. The anterior section will be found adherent to the slide. This relieves the greatest points of resistance, and the posterior section may then easily be detached from its position and the whole removed from the mouth. It only remains to bring the two sections once more in contact and the impression is ready for casting.

Secondly, in order to obtain a plaster impression of a similar case, proceed in the same way for the first half of the operation, of course substituting plaster for composition. If the plaster should curl round the anterior surfaces of the teeth pare it off when sufficiently hardened; then apply the roll of composition and slide as before described. Thus we have an easily-removable impression in plaster of the important parts, namely the palate and lingual surfaces of the teeth,

while their anterior surfaces are sufficiently well taken in composition. This, then, describes in as few words as I can employ the use and action of the "Slide Section Tray." A little practice of course is necessary for its successful employment, but I think its possibilities are sufficient to warrant me in introducing it to the notice of my brother practitioners.

It is useful in bar lower cases when the bicuspid incline inwards or the incisors project. It will also simplify modelling in cases of marked erosion, and may be employed in cases of irregularity and cleft palate with advantage. Other conditions where its use may be indicated I need not dwell upon.

NOTES OF A CASE OF COMPOUND FRACTURE OF SUPERIOR MAXILLA AND NASAL BONES.

By J. ACKERY, M.R.C.S., L.D.S., and W. B. PATERSON, F.R.C.S., L.D.S.

FRACTURES of the superior maxilla are so uncommon in civil practice that I thought a few notes of the present case might be of interest to the Society.

James McCarthy, æt. seventeen, newspaper boy, was struck on the left side of the face by a "swing boat," in which two persons were seated. He was rendered unconscious for about ten minutes, and was subsequently admitted into Darker Ward, at St. Bartholomew's Hospital, under the care of Mr. Morratt Baker, on March 28th, 1889.

State on admission (taken from registrar's and dresser's notes) :—

"Face much bruised and swollen, large hæmatoma under and around left eye, pupils of both eyes normal, considerable chemosis in left eye, marked crepitus extending from left molar region transversely across the face and over the nose. The orbital plate of left superior maxilla apparently not implicated, the fracture being below it. There is a wound about half-an-inch long over the bridge of the nose, through which the left nasal bone protrudes, and another one-and-a-half inches long running transversely outwards from left nostril, at the bottom of which bare bone can be felt with the probe.

Tongue lacerated in two places. There is much displacement of upper jaw, the left alveolar process and teeth being about half-an-inch lower than the right."

On the morning of 30th of March I was asked to see the case and found the face still much swollen, and the entire upper jaw displaced downwards and to the right as above described. The relative position of the upper and lower jaws will be better understood from the accompanying models than from any description I can give. The upper jaw could be moved *en masse* laterally, also downwards and to the right as if "hinged" about half-an-inch above the alveolar border on the right side.

I decided to put the fracture up with the lower jaw as a splint, and later in the day, chloroform having been administered, I was able to reduce the displacement fairly well, but not without using considerable force, as the bones of the left side of the face seemed "stove in." On bringing up the lower jaw the teeth came into fairly good position, though the articulation was not very exact. A four-tailed bandage was applied and retained the bones well in place, but owing to the damage to the nose and the swollen condition of the tongue the patient's breathing was so seriously interfered with that it became necessary to loosen the bandage. Sickness supervened, and it was not thought advisable to attempt any further treatment at that time. On the following day, 31st inst., impressions of both jaws were taken, and the upper jaw temporarily held in position by a piece of half-inch composition gaspipe flattened so as to form a "bit," which was placed across the upper arch below the first molars, and then being turned upwards and backwards was fixed by a bandage carried over the occiput.

The models having been cast a dental alloy plate was struck up, fitting over the palate and teeth in the upper jaw. A socket was then soldered along the upper and outer edge of the plate on either side. A stout piece of iron wire was then flattened at the end and fitted to the socket on each side and brought round well in front of the angle of the mouth, and the ends directed backwards, terminating in a hook in front of the ear. A bandage was now made fast around the hook on either side and tied below the occiput, and another bandage passed under the bars on either side was secured on the top of the head and kept the jaw in good position. This apparatus was put in on the 2nd and worn until the 5th inst., allowing free use of the lower jaw, but was then found

to be causing a slight sore at the angle of the mouth on the left side, and that it failed to keep the parts in position, as the patient was restless at night and moved the splint as he turned on his pillow.

On the morning of the 5th inst. Mr. Paterson saw the case with me, and we agreed that a Gunning splint was necessary. As I was leaving town Mr. Paterson kindly consented to take the case in hand, and the subsequent history I will read in his own words. I would add that the credit of bringing the case to a successful issue belongs entirely to Mr. Paterson.

Mr. W. B. Paterson's notes ran as follows :—

When I first saw the patient the swelling of the face had subsided. The soft tissues around the seat of fracture were thickened and indurated by the inflammatory exudation, and so interfered with the free movement of the upper jaw from side to side and in the upward direction previously described.

The amount of displacement of the upper jaw towards the right is fairly accurately represented in the models sent round. The teeth, however, do not come out as well as they should, owing to being coated with the inflammatory secretions of the mouth. If the bite be disarticulated, a normal articulation of the teeth can be produced, showing that the fracture has not displaced them at all. It will be noticed that the left upper and lower lateral and canines are the only teeth which articulate. The crowns of the left upper bicuspid and molar lie internal to and below the level of the crowns of the corresponding lower teeth, and the right upper molars and bicuspid are external to and separated from the lowers a space of half an inch.

With one's hands, and using considerable force to push back the upper jaw into its proper place, the displacement was only reduced to the extent that the outer cusps of the left upper bicuspid and molar could be brought to rest on the masticating surfaces of the inner cusps of the corresponding lower teeth ; but directly the pressure was removed the jaw slipped back into its old position.

No better reduction being obtainable, the prognosis for a normal bite was not favourable.

A dental alloy plate, on the principal of Kingsley's splint, had been made by my colleague, Mr. Ackery, before I saw the patient, and as it fitted well and was strong, I removed the side wires attached to it, and utilised it in the following manner : A bite was first taken with wax on the plate as

best one could ; and I may say I was assisted by the house surgeon and dresser in forcing the jaw over to its right position as far as possible, and in fixing the head meanwhile whilst this was being done.

A vulcanite box was then added to the plate on either side for the lower bicuspids and molars to bite into. In shaping these boxes a close fit with the lower teeth was not aimed at. They were lined with softened gutta-percha, and the splint thus arranged was fitted in the mouth, and the same method being pursued as when taking the bite, the lower teeth were brought to close into the boxes, and fixed there by an external apparatus.

The external apparatus consisted of a padded metal chin-piece with side straps attached to it. These straps passed up in front of the ears and were connected with buckles sewn on a short and thick piece of strong elastic webbing, which did not stretch too easily ; and these elastics were fixed to the sides of a stout and well-fitting head-cap, so that an amount of constant pressure might be kept up. A cap is more comfortable to wear, I think, than bandages or straps round the head—the pressure being more equally distributed, and with short hair and several ventilating holes, is not otherwise objectionable.

The patient took his liquid food very well through the space provided in the front of the mouth by the propping of the bite in the molar region, and which was high enough for the purpose without causing strain and discomfort at the temporo-maxillary joint. He used antiseptic mouth washes with a syringe frequently.

I removed the plate after it had been worn a fortnight to see what improvement of the displacement had occurred, and it was gratifying to see a very distinct amount. The plate was worn a month, and Mr. Morratt Baker being satisfied with the union of the fracture, the patient was then discharged. His bite was almost correct then. Three weeks ago Mr. Ackery and I saw the patient, and the articulation of the teeth was perfect.

The chief point to bear in mind in the treatment of this case or any similar one, I consider, is the reduction of the displacement by means of the bite of the lower jaw, which acts as the necessary opposing force ; and for this purpose some such form of Gunning's splint as that described answers extremely well.

British Journal of Dental Science

LONDON, JANUARY 15th, 1890.

TEACHING OF MECHANICAL DENTISTRY.

WHATEVER may be the feeling throughout the profession as to the advisability or not, of giving the dental student his instruction in mechanical dentistry in a dental hospital, or dental department of a general hospital, it seems admitted upon all hands that the present system of teaching in this most important branch of dentistry is far from what it should be. We do not propose at present to discuss how far the apprenticeship is a beneficial institution; in our eyes it possesses many and great advantages, to counterbalance which many evils would have to be proved to have followed from it, before we could part with it, save with regret. However this may be, there is a strong feeling abroad that our students do not under existing conditions devote enough of their energies to the procurement of full efficiency in all branches of dental mechanics. Probably no one feature about the successful dentist is more conspicuous than his handiness. He is not only a book man, he is as deft at his bench as in the meeting-room of his societies, and at a pinch can sit in his mechanic's place and show him "how to do it," aye, and give him "points" at it. But this does not come without teaching, or without work. That native expertness, a bias for mechanics, if you please, we grant may exist, but they must be duly practised and regulated, must, in other words, be properly educated. It too often happens that boys fresh from school are not sufficiently alive to the importance of the instruction to be obtained in the workroom of the dentist to whom they

may be apprenticed, and hence scamp what they have to do, and avoid all that they are not absolutely compelled to execute. To remedy the omissions of apprenticeship is at present not an easy matter, but such filling up of educational gaps has now become imperative, for, as we noticed in a former issue of the *British Journal of Dental Science*, the Dental Examining Board of the College of Surgeons of England has given warning that at all examinations to be held in the future, very much greater stress will be laid upon practical work in dentistry. The energy which has been conspicuous in the promotion and furthering of the Dental department of Guy's Hospital, has not been backward in suggesting a remedy for this state of affairs, and accordingly a dental laboratory has been commenced which in due time will afford students opportunities for practical instruction in mechanical dentistry. It would be unjust to the Dental Hospitals in London not to say that they have for some time been aware of the importance of the question, 'How shall we teach our students mechanical dentistry?' and more or less effort has been made to establish demonstrations and other supplementary modes of instruction over and above the lectures given on mechanical dentistry, which should enable the student to maintain himself abreast of the progress in his profession. The time, however, seems to have come when fuller and systematic teaching in this branch must be undertaken by at least one of our great teaching centres. It does not in any way follow that the establishment of such teaching should supersede or render nugatory the apprenticeship; for the three years of probation at present spent in the dental workshop certainly subserves the useful purpose of thoroughly familiarising the dental ignoramus with the lines in which he will hereafter be constrained to work, as well as teach him to use his hands, an accomplishment which could hardly be acquired in a hospital where alike time, space and material are necessarily very limited, and the supervision to each student must be comparatively slight and inadequate for a beginner.

DENTAL LECTURES TO POPULAR AUDIENCES.—Dr. George Cunningham has, with characteristic energy found Cambridge too limited for his exertions, and has therefore sought the wider field of London for his popular lectures on dental hygiene. Dr. Cunningham is treading upon dangerous ground in addressing an audience upon the care of their teeth. That he has done so is to his credit, for he who can teach popular audiences the rudiments of dental physiology and hygiene without incurring the ill-natured criticisms of his confrères is accomplishing a great deal. There is no question but that such teaching is sorely needed, and is likely to do great good when done in the manner which Dr. Cunningham has adopted, with descriptions pithy and lucid, and ample illustration by means of diagrams. The lectures were most successful and highly appreciated. Sequah is upon the warpath, but we are assured that were the masses less ignorant, Sequah would find his occupation gone. Dr. Cunningham, and those who, like him have the courage to address the public upon dentistry, and yet do so in such a manner as to leave no doubt upon the minds of the audience that only philanthropy prompts the utterance, are doing much to expedite Mr. Sequah's exit.

ANNUAL REPORTS of the Birmingham, Brighton, and Victoria Dental Hospitals are to hand, but owing to the great demands upon our space we are obliged to forego their publication until our next issue.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.—At the Annual General Meeting held on the 13th ult., the following officers were elected for the session, 1890—91 :—President, Mr. Felix Weiss ; Vice-Presidents, Messrs. Canton, Stocken, Hepburn, Wheeler, Macleod, Redman ; Treasurer, Mr. T. Arnold Rogers ; Librarian, Mr. Ashleigh Gibbings ; Curator, Mr. Storer Bennett ; Editor of Transactions, Mr. Walter Coffin ; Secretaries, Messrs. Betts, Ackery and Maggs ; Councillors, (resident), Messrs. Woodhouse, Matheson, Scott Thomson, Tomes, Willoughby

Weiss, Woodruff, Hern, Newland-Pedley, Boyd Wallis ; (non-resident), Messrs. Parson, Stack, Vanderpant, Dickenson, de Lessert, Fothergill, Bacon, Mason, Stevens.

THE INTERNATIONAL CONGRESS OF 1890.—The meeting which is to take place in Berlin during August promises to be an interesting one to dentists. Dr. Busch acts as secretary, and it is anticipated that a large attendance of continentals and Americans practising dentistry will be present. We shall publish full particulars in our next issue.

EXTENSION OF THE TERM OF DENTAL GRADUATION.—We are pleased to read the following in an American contemporary.—“The following resolution was passed at the last session of the National Association of Dental Examiners : It is the sense of this association that no one should be permitted to assume the responsibilities of a dental practitioner until he shall have had at least three years' previous study and instruction, inclusive of three full terms of not less than five months each, in a properly organized and equipped dental college, provided that time spent in the study of medicine or graduation from a medical college may be credited on this requirement not to exceed the period of two years or two full terms of collegiate instruction ; and recommending to such State boards of dental examiners as are by the laws of their respective States required to issue licenses to practise dentistry to all holders of diplomas from reputable dental colleges that they may make such rules as shall require all colleges to make three full calendar years of study and the attendance on three full college terms of not less than five months each, a prerequisite to graduation ; and that only such colleges as shall comply with this rule on or before the beginning of their scholastic year of 1890—91 should thereafter be considered as reputable ; and that all State boards should, when their State laws permit it, decline to grant a license to practise to any one who cannot produce evidence showing that he has spent at least three full years in study and preparation before attempting to assume the responsibilities of a dental practitioner.”

The National Association of Dental Faculties also adopted a rule requiring attendance upon three full regular courses in separate years before examination for graduation. The regular courses were made "not less than five months each." The time when the new rules shall go into effect was fixed at the beginning of the session of 1891-92. It was also ordered that the resolutions requiring the attendance on three terms be published in the announcements for the session of 1890-91.

A CASE OF SUDDEN DEATH accounted for by Swallowing of Artificial Teeth.—The mystery attending the circumstances of the death of Mrs. Margaret Louise Bryden, at her residence, Linden Gardens, Chiswick, has been cleared away by the post-mortem examination held by Dr. Dodsworth, one of the police surgeons. This disclosed the fact that the body was extensively diseased, and that the lady had been suffocated by swallowing her false teeth, which were found in her gullet. It is supposed that having swallowed her teeth accidentally, she placed the night-dress case in her mouth, either in order to vomit or secure a better hold of the teeth, and died, before she could accomplish her purpose, from suffocation. No marks of violence were discovered on the body, nor was the deceased's clothing disarranged. There was nothing in the appearance of the room where the body was found to indicate that anyone else had occupied the apartment. The suggestion is that the deceased retired to her room with the intention of going to bed, and that after partially undressing she seated herself on the side of the bed before removing her teeth, and that whilst in the act of dislodging them she failed to prevent them slipping down her throat. Inspector Rawlings and Inspector Warren have made every inquiry into the matter, but they have no reason to suspect any foul play. Instead, they regard the case as one of misadventure entirely. So far from there being any suggestion that Mrs. Bryden was in the habit of receiving visitors at her residence, the domestic who was in her employment states that there have been no callers at the house during the time she has been in the deceased's service. It is certain that the man seen talking to the de-

ceased lady outside her own door on the night of the occurrence was John Hewett, a plain-clothes constable, whom she had called, and to whom she stated that she wanted someone to stay with her. She had been exceedingly nervous during the absence of her servant in Scotland, and appeared to be afraid to remain in the house alone. The inquest, opened on Saturday, will be resumed on Thursday, the principal witness to be called being Dr. Dodsworth.

ANOTHER DEATH from a like cause is reported in a Liverpool paper. James Aspin, aged 33, a collier residing in Accrington Road, Wood Top, Burnley, died on Saturday, as the result of an accident which occurred four years since. The case is an extraordinary one. It appears that the deceased had four false teeth, and he was in the habit of going to bed without taking these out. One night, nearly four years ago, he had a sudden fit of coughing which loosened the teeth, and he swallowed them together with the vulcanite roof. Dr. Wilson was immediately sent for, and he has attended the patient regularly ever since. The case has been one of special interest. Probing revealed that the foreign substance was lodged in the throat and was immovable. Having obtained a new instrument of whalebone with a button at the end the doctor succeeded in getting hold of the teeth, and could have forcibly extracted them, but it would have been at the cost of tearing the membrane, and the patient could not bear it. As the button had apparently fastened on the clasp of the teeth, it was impossible to release it. The whalebone had to be cut. About six inches of it was left in the throat, was swallowed, and entered the stomach. The patient was afterwards admitted to one of the Liverpool hospitals, but it was not deemed advisable for him to undergo an operation. Under the care of Dr. Wilson he survived until Saturday. Unable to take any solid food, he nourished himself on beef tea and liquids, and although he could not follow his work he had not been altogether confined to the house, until about eight days ago, when his declining strength compelled him to take to his bed. Since his death the doctor opened the gullet of his throat, and the teeth and vulcanite plate rolled out intact, indicating that the clasps of the teeth had got hold of the membranes, but that the substance was too large to pass into the stomach.

Abstracts of British & Foreign Journals.

INTERNATIONAL DENTAL JOURNAL.

THE TEETH AS A FACTOR IN DIAGNOSIS.

By RICHARD C. NEWTON, M.D., Mount Clair, New Jersey.

CAN we tell anything about a person's constitution or habits, or anything relative to the presence of actual disease by merely examining the teeth? Referring to Mr. Jonathan Hutchinson's teaching in reference to the teeth in hereditary syphilis, he states his belief that the so-called Hutchinsonian teeth are not always present in cases of undoubted syphilitic inheritance, and that teeth having these or similar peculiar malformations may be present in hereditary ataxia and rheumatism ; and even sometimes in rickets. Now, there is urgent need that the percentage of cases of hereditary syphilis showing Hutchinson's teeth should be determined. We want a great number of observations of people in health, or at least so well that they do not come to the physician. These important truths can be established only after years of study and observation. Referring to the value of Hutchinsonian teeth he mentions a case in which only one member of a family of four had these pronounced marks of syphilis, but undoubtedly the practised eye and skilful touch of a dentist might have detected certain peculiarities in the teeth of other members of this unfortunate quartette. Referring to Gouty teeth he finds the different descriptions of the teeth agree, and there seems no doubt that when present, such teeth as Dr. Thompson described do indicate a gouty diathesis. There is a form of Bright's disease which is known as gouty kidney. There are affections of the brain, eyes, liver, heart, and blood-vessels, not to mention the articulations, which are ascribed to the gouty diathesis. At the meeting of the Practitioners' Society, Dr. Gibney spoke of peg-shaped teeth, and said that he often observed them in children with joint diseases. He thought that these teeth, instead of being called strumous or scrofulous teeth, would now be called tuberculous teeth. So far as this observation goes, it tends to show that there is a peculiar shape to the teeth in tubercular or scrofulous children, although the teeth of consumptives are as a rule good, at least in the earlier

stages of the disease. This fact might be used in favour of the present theory to the effect that phthisis is at first a local and not a constitutional disease. In cretins the teeth come very slowly, the process often occupying many years, and being accompanied frequently by an offensive salivation and convulsions. In rickets the first dentition is delayed until after the child is twelve months old, whereas in hereditary syphilis the first dentition occurs before the sixth month. Hence the time of the eruption of the teeth enables us to distinguish between two diseases that were formerly confounded,—often to the great injury of the helpless patient. In Bright's disease the teeth are said to be abnormally sensitive. This is a very important point, on account of the great frequency and fatality of this complaint, and on account of the difficulty which we often encounter in making a diagnosis early, the opportune time. It is true that examinations of urine are, as now made, very exact. Professor H. C. Wood says that in some cases of morbus Brightii the urine is unaltered, at least for considerable periods. In scurvy and in lead poisoning the appearance of the teeth and gums is pathognomonic. In idiots the teeth present every anomaly of appearance and disposition. They grow and are shed without any regard to order or rule. In "Seguin on Idiocy" a case is mentioned of an idiot girl of eighteen who was shedding her fifth set of teeth. In idiots the number of teeth also seem to be frequently either above or below the normal, Writers tell of double and even triple rows of teeth in the jaws of these unfortunates. The pitted, notched and stained teeth which we often see are said to indicate that their owner suffered from fever or other exhausting disease during the calcification of these teeth. A curious difference in the health and vigour of the teeth in the same jaw has often been noted, some teeth being soft and friable, and others firm and vigorous. This condition can generally be traced to a fit of sickness which seized the patient during the calcification of those teeth found to be unhealthy. If in Bright's disease the teeth cannot retain a filling because they are so exquisitely sensitive, it is high time that medical men knew something more definite of this phenomenon. Dr. Sexton says that in 1500 cases of ear disease he found that perhaps one-third owned their origin or continuance in a greater or less degree to diseases of the teeth. One would infer that the aurist, at least, should be well up in dental pathology and therapeutics. Another peculiarity of the teeth

and jaws has excited some comment, and led to considerable research during the last few years. The V-shaped and saddle-shaped jaws. He thinks that it has been pretty well settled that they do not belong to any especial diathesis. They seem to come from several causes, and to affect the health mainly because they are apt to cause mouth-breathing, a pernicious and hurtful habit. They perpetuate mouth-breathing ;—for breathing through the mouth seems to be one of the principal causes of the condition. The enlarged tonsils which are so common by more or less occluding the posterior nares, engender the habit of breathing through the mouth. The mouth is almost constantly open, especially during sleep. The lower lip hangs down and draws the extremities of the upper lip against the cuspids and bicuspid teeth. This constant pressure, especially during the eruptive period, forces the teeth inward, makes the upper jaw narrower, and pushes the incisor teeth forward and upward. This deformity can generally be cured if taken in time. As to irregular and crowded teeth in general, it is acknowledged that they decay and perish sooner than even and regular teeth. This must be partly due to the mechanical difficulty in keeping them clean ; but in part, because they are more perishable. He thinks the two principal reasons for the irregular and perishable teeth of children are (1) sending them to school too early, and (2) feeding them improperly. For example giving an insufficient supply of phosphates. Baron Liebig says that one thousand pounds of wheat contains twenty-one pounds of phosphates, and one thousand pounds of white flour contains five-and-a-half pounds of phosphates. In other words, by our absurdly wasteful process of preparing flour, we have removed about three-fourths of the bone, tooth, nerve, and brain food from our children's bread. Dr. Kingsley says, "The primary cause, so far as the individual is concerned, of any general disturbance in the development of the permanent teeth showing itself, particularly in their malposition, is directly traceable to a lesion of or innervation of the trigeminus nerve ; that it is an interference, more or less prolonged, with one of the prominent functions of that nerve, and operating at its origin. The function of the trigeminus, thus stimulated or interrupted, is that which supports, regulates, and governs the nutrition of the tissues to which its terminal branches are distributed." Professor Austin said, in one of his lectures on the fifth nerve, "The nervous centre in which the trigeminus is implanted is of all nervous centres the one which, in the

human subject, is most liable to congenital imperfection of the kind which necessitates a break-down in its governing functions at a special crisis in the development of the organism.

ITEMS OF INTEREST.

TAKING AN ARTICULATION.

By Dr. L. H. HENLEY, Marshall, Texas.

No "bite" can be absolutely reliable. He makes the patient retain the wax for a considerable time to mark the curve of their lips plainly on the wax, in this way securing a proper contour of the face. These marks may not run parallel with the alveolar ridges and the alveolus. The median line of each jaw may not be the same: but nothing can be lost by giving the teeth the most agreeable appearance possible. Taking these points well into consideration, make the best articulation possible, allowing the teeth to occlude so as to avoid the moving of the upper plate in prehension. When the teeth are finished, place them in the mouth, and to get a comfortable occlusion tell the patient to hold the teeth firmly together for a few moments. As quickly as possible prepare a little plaster, tolerably stiff, and introduce on either side with the finger, holding firmly till the plaster sets; then remove both plates together, and in this manner put them into your articulator, after which you can remove the plaster. This will show you exactly the articulation you have; now by cutting off a point here and there you can easily produce a perfect occlusion that will cut a fine thread on either side, and in this way prevent the soreness caused by rocking and sliding I was once much bothered with. For particular plates he always uses modelling composition; when it is in place he introduces a small bit of ice trimmed to suit, and holds it against the impression cup and compound. This will make it hard rapidly. Remove it carefully, and before pouring in your plaster, set a bit of wire or even a bit of match stick, that has previously been wet, into the impression made by each tooth that stands apart, or any tooth that you wish to be very careful not to break. This will give you a strong model. He uses a piece of wood that has been moistened because the plaster will set better around it.

DENTAL OFFICE AND LABORATORY.

TAKING LOWER IMPRESSIONS.

DR. F. C. GREEN, in experimenting in taking lower impressions, believes he has succeeded in finding a means by which a perfect impression may always be obtained in those difficult cases where the absorption has been great and where the attachment of the muscles is very close to the alveolar border, rendering it difficult to construct a plate that will not impinge on the muscles and rise whenever the patient opens his mouth or raises the tongue. The method is as follows : Use a very narrow impression cup, one not much wider than the alveolar ridge ; fill the cup with plaster, very soft, adding a little sulphate of potash to make it set rapidly. When hard, remove from the mouth, and with a small scraper, remove a thin layer over the entire surface of the impression ; trim the edges, and especially the tongue. Place the impression in water for a few minutes and when thoroughly wet fill it with very thin plaster, not thicker than cream ; place it in position in the mouth with gentle pressure ; observe that the buccinator muscle is not impinged on, and request the patient to raise the tongue, letting the point rest on the cup. When hard, remove, and if each step of the process has been carefully taken, the result will be an impression from which a plate can be constructed that will not rise or rattle while speaking. He never uses anything but plaster for taking impressions of the mouth, believing it to be the only reliable material for this purpose.

WE have received a handsome almanac and photograph, the latter representing the Briggate, Leeds, a souvenir of the British Medical Association's Meeting at Leeds, which took place last year. The calendar is very handy for medical men, as on its obverse is a list of Messrs. Burroughs and Wellcome's preparations. This firm have intimated their willingness to forward specimens to any member of the profession who will apply for it.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

DISCUSSION

On Dr. Semon's Paper on the "Etiology, Diagnosis, and Treatment of Empyema of the Antrum."

The PRESIDENT felt it was hardly necessary to formally give expression to the thanks of the Society to Dr. Semon, for the applause testified to their gratitude. To busy practitioners, the practical must always possess charms of its own. He proposed to reserve his remarks until others had spoken; he might, however, say in opening the discussion that he believed empyema of the antrum to be far more common than was usually suspected. He had not, however, always entertained this view, for formerly when he was attached to a large general hospital and working amongst its out-patients, with the keenness of a young man, the cases that had come under his notice were so few that he had been led to say that they were rare, and that either acute or chronic inflammation was seldom seen. In private practice, however, he had now seen with Dr. Semon and others a good number of cases, and hence he had come to the conclusion that although those cases were not common they could not be deemed rare. They were very important cases, needing close study and attention, as they were often not diagnosed and the patients allowed to go on with their condition unameliorated. He would, however, not say more, but call upon Mr. Christopher Heath, who amongst surgeons had done more work than most in treating diseases of the jaws.

Mr. Christopher Heath said he rose in obedience to the call from the chair. He was aware that much had been done upon this subject by foreign observers, but he was surprised, after hearing Dr. Semon's most valuable compendium of what had been done, to find how little advance had been made upon the classical account given by Hunter. He thought it should be carefully borne in mind that the purulent discharge from the nostril was not by any means always due to antral disease. Indeed it was remarkable how seldom ordinary catarrh seemed to attack the antrum, even when it spread to the frontal sinuses. His experience led him to the belief that diseases

affecting the nose seldom led to antral trouble, but that this was practically always consecutive upon disease affecting the teeth. In reference to the necessity for removing healthy teeth, to which reference had been made, it did not appear to him to be at all necessary, because antrum trouble was seldom associated with healthy teeth, and further, because it was easy to tap the antrum by a method he had commonly adopted—namely, by a puncture above the alveolus, which answered very well. The opening secured, he had found washing out was easily effected through an ordinary Eustachian catheter, and the patient very soon learnt to insert the catheter for himself and wash out his own antrum. By sitting before a looking-glass the puncture hole could readily be seen, and most persons were thus enabled to carry out satisfactorily the after treatment for themselves, or even, if they failed, a servant could easily perform the service for them. He found, however, that as a rule the syringing out was most inefficiently performed even when properly prescribed. A small vulcanite, or—even worse from its liability to break—a glass syringe was often used and the antrum hardly cleared. He employed a much more powerful injector, and instructed his patients not to be contented unless a really full stream found its way into the nose from the cavity. Mr. Heath felt some disappointment that Dr. Semon had been unable to mention more about antral empyema in connection with those cases in which the nasal aperture was either very small or altogether absent, as these cases gave surgeons much trouble from the extreme difficulty in arriving at a certain diagnosis. He had personally no experience of electric illumination of the antrum, but felt very considerable doubt as to its utility in the majority of cases. From a long experience with bones he believed they varied so much in their degree of thickness that no certainty would be felt if the antrum remained dark in spite of the electric lamp. He should be little inclined to base a diagnosis of the presence of pus on this method. The crackling of the antral walls, which had been alluded to as a symptom of empyema, was, he believed, rather a sign of cystic disease than of pus in the antrum, as the thinning of the walls leading to crackling could only occur if the pus had been unable to escape for a very prolonged period. He believed empyema was often overlooked or not diagnosed, and in many cases operations were undertaken to relieve suppurative diseases of the nose and nasopharynx, which of course failed as the true cause of

mischief—the empyema—was overlooked. A case in point was that of a young and good-looking widow, who was under a distinguished practitioner, well versed in naso-pharyngeal surgery, and who was put under more than one operation for the relief of post-nasal adenoids and other supposed causes of her suffering, but all in vain. At length it was determined to trephine the frontal sinus, but fortunately, the lady and her friends asked for a further opinion before the disfigurement was submitted to. Upon the lady coming to Mr. Heath, he recognized her case to be one of empyema of the antrum, and advised the ordinary operation instead of the trephining. As soon as the antrum was tapped and drained her symptoms ceased, and she got quite well. He must, however, confess that although some cases were pleasant and satisfactory others were not so, but lingered on for years in spite of the utmost care and attention. Some of these cases he believed were due to too much washing-out of the antrum, as these were liable to keep up irritation and cause chronic disease. He should very much like to learn when it was really safe to allow the opening to close, for his experience went to show that if it were allowed to close it was often necessary to make a fresh opening, and if it were maintained patent very long the condition became chronic.

Mr. Wallis said he had during ten years gained considerable experience of the cases under discussion. He quite agreed when it was said nearly all the cases were caused by the diseased conditions of the teeth. He had, however, quite recently met with an instance of empyema following disease of the nose, the teeth being perfectly sound. He described a case lately under his observation in which he had opened the antrum after removing a tooth, and syringed the cavity out for a week; at the expiration of that time the patient went to America perfectly healed. The tube was worn for three weeks, but as no discharge occurred, the patient, with Mr. Wallis's consent, left off wearing the tube. In two days time the disease recurred without any apparent cause; the tube was reinserted and the patient again recovered and remained well so long as the tube was kept in. Cases in which all the teeth were sound being extremely rare, there was seldom, if ever, any necessity for the extraction of a sound tooth, since if careful search were made it was pretty sure to reveal that one or more teeth were carious. Again, his experience had taught him that even if the tooth which had caused the antral mischief had been extracted, that condition

might persist for many years—in one case with which he had met, for fifteen years. An important point in diagnosis of empyema was that, as Dr. Felix Semon had mentioned, the patients were themselves aware of the foetid smell of their discharge and often sought relief simply on account of it. In this particular a difference existed between that condition and *ozæna* in which, while the discharge was most offensive to the patient's friends, he himself was unaware of its foetor. Mr. Wallis thought that in cases of doubt it was advisable to make an exploratory puncture into the antrum, as the proceeding was harmless even if no pus were detected. Quite a small drill should be used. Sometimes he had found that even when no pus was detected at the time of the exploration it flowed from the puncture later on, so that he felt it was desirable when a purulent discharge occurred from the nose to puncture the antrum.

Mr. Henri Weiss thought that a peculiarity of the anatomical structure of the antrum might in some cases help to explain why pus was often not struck by puncture. It was by no means rare for the antrum to be divided into loculi by septa more or less complete, so that pus might exist in one or other of these, and unless the puncture were made into the particular division which was effected failure would result. If this anatomical fact were borne in mind, Mr. Weiss thought that it might be justifiable, when one puncture failed, to attempt to reach pus by making other openings.

Mr. Cunningham thought that if it were important to determine the question as to the alleged increased frequency of the disease, they could help the author by giving him the results of their own practical experience. During twelve years' practice in England he had not met with one single case amongst his own patients. The only cases he had treated had been two referred to him by London dental practitioners. Case I. was of the favourable type, a Cambridge undergraduate, aged twenty-one, with a copious offensive discharge from the right nostril. The alveolus over the three upper first molar roots had been the seat of frequent slight abscess formations. No pus or discharge was observable on extraction of these roots. The mesio-buccal socket was considerably absorbed, and the insertion of a drainage tube into this socket, followed by almost daily irrigation with common salt solution, and later on a very dilute phosphoric acid solution, in less than a month resulted in the cessation of the discharge and the closure of the opening into the antrum. Case II., that of a

middle aged lady, was exceptional from the fact that the normal opening of the antrum into the nose seemed permanently occluded. The previous history of the case is interesting from several failures to diagnose the disease. The patient recounted that she had suffered for some years from numerous gumboils on the left upper jaw. In January, 1888, the swelling of the upper part of the face became more serious and prominent, though relieved to some extent by the alternate treatment of poulticing and lancing resorted to by the local medical practitioner. Matters becoming worse towards the end of March she consulted a physician, who recommended her to a dental practitioner, and he on March 22nd extracted a left upper bicuspid, which was followed by profuse bleeding. On the following day there was a considerable flow of pus from this socket. As the swelling still remained considerable and a discharge oozed from the socket, she again consulted the physician and the dentist before referred to, when they recommended the removal of the remaining two upper molars. Dissatisfied with that opinion, she consulted a London dental practitioner, who at once diagnosed that the antrum was involved, and referred her to Mr. Cunningham, without informing him, however, of his diagnosis. On the 7th May, 1888, the latter found that the general swelling extended over the roots of all the teeth between the incisor and the second bicuspid, and that the socket of the first bicuspid had healed over with the exception of a small fistula, through which a blunt probe readily passed into the antrum. On enlarging the opening there was a very considerable flow of pus. On syringing the antrum it was found impossible both at that and subsequent sittings to force the solution through the antrum into the nose. The two remaining upper molars were carious with exposed pulps, which were removed and the root canals filled at subsequent sittings. The principal dental feature of the case seemed to be the condition of the left upper lateral, which was loose, tender on percussion and the gum over the root considerably inflamed, while the pulp had all the appearance of being "dead." On drilling through the palatal surface of this tooth the pulp was found to be in a pasty degenerated condition, with no apparent putridity. On clearing out the pulp cavity it was found that the apex of the root was patent. The root canal was then filled in the usual way (May 10th, 1888). In a short time the general swelling entirely subsided. As a slight discharge continued

despite careful syringing on the part of the patient, she was advised that a complete cure could not be effected without establishing a second opening into the antrum in order to obtain effective irrigation, and she was strongly advised to have the nose examined with a view to ascertaining the cause of the closure of the opening into the left nostril, but as the discharge was so slight she was unwilling to submit. On January 4th, 1889, the patient reported that the discharge still remained slight and inoffensive but persisted that the left upper lateral must be connected with the trouble and desired to have it extracted, which was done. On injecting through the socket of the bicuspid the solution passed out partly through the socket of the incisor and *vice versa*. The socket of the lateral rapidly healed and the patient continued to syringe the cavity through the bicuspid socket which still remained patent, which it will probably do until the natural escape of the antral secretions can take place into the nose. The patient had not been seen for some months, but wrote the other day that she only finds it necessary to syringe the cavity occasionally, and seems quite content with her present condition, which is that of a chronic antral fistula. From an experience of the results of the accidental perforation of the antrum in the process of implantation he would conclude that the exploration of the antrum by drilling through from the mouth without removal of any of the teeth would usually be attained with no untoward results.

Mr. Hern said that as Dr. Semon had given the Society the reasons *pro* and *con* for making an alveolar opening into the antrum rather than a nasal passage, he might mention some others which were, he thought, strongly in favour of the alveolar puncture. All were aware how readily openings in mucous membranes closed up, so that in cases like those under discussion, which were very chronic taking a long time to get cured, there would be a great tendency for any puncture through the nose to close up before the antrum had thoroughly resumed its healthy condition. And again, a second advantage of the alveolar method consisted in the facilities it afforded for patients to syringe themselves without the aid of special appliances. If the ostium maxillare were not completely occluded, the alveolar puncture permitted of thorough syringing through from the nose, the fluid escaping from the alveolar opening. Mr. Hern was disappointed that Dr. Semon had been unable to tell them of any plan by which the tedious period of after-treatment might be curtailed. He should also

like to hear from the reader of the paper when he considered it advisable to encourage the puncture to heal up.

Mr. Maggs reported a case bearing upon the subject which had occurred in his practice about three weeks ago. The patient was a girl of twenty-three, who had lost the bicuspid and first molar on one side ; she suffered great pain in the cheek, and had a purulent discharge from the nostril. There was flattening of the palate viewed from the mouth ; no dead teeth except the lateral of the same side, which was removed under gas. Some blood and purulent discharge followed the extraction, and the cavity was therefore washed out with carbolic acid lotion. The case did very well.

Mr. Van der Pant related a case of a girl who was supposed, by her doctor, to have antral disease. The doctor removed a root of one of her molars, but as he used no anæsthetic, and the operation was a very painful one, the patient refused to go to him again. Upon being brought to Mr. Van der Pant he found there was a slight discharge from the left nostril, and the mouth contained a number of rotten stumps. The roots were all removed under nitrous oxide gas, but the antrum was not opened. The discharge ceased, and the general health of the patient underwent immediate amelioration. This case showed that sometimes conditions due simply to diseased roots simulated empyema of the antrum, or as least might be confounded with it.

Dr. Greville MacDonald said that although he quite agreed with most of the conclusions enunciated in Dr. Semon's admirably complete paper, there was one point upon which he felt himself compelled to differ, viz., as to the ætiology of empyema of the maxillary sinus. He had himself had eighteen cases of the disease, in fifteen of which there was evidence either of existing or former intranasal disease—such evidence as would remain unquestioned by anyone conversant in the method of examining the nose. In the other three, moreover, although there was no present indication of disease, the patients had ascribed the origin of their trouble to a bad cold in the head. He was compelled to admit, however, that in one of these cases his colleague, Mr. Leonard Matheson, who had operated upon the majority of his cases, believed there was strong evidence of the mischief having originated in the teeth. Dr. MacDonald made a few additional remarks upon the question of diagnosis, so far as it was illustrated by his own cases. The only subjective symptom of any value was pain. Most often it was referred to the cheek and described

as face-ache, though in two cases it was distinctly supra-orbital and was relieved as soon as the pus was evacuated. In each of these cases the attacks of pain supervened regularly at eleven and one o'clock respectively every morning, to pass off after two or three hours, as soon as the discharge began to flow from the nose. In one of these cases the access of pain was preceded by formication and pricking over the brow; while in the other it was accompanied by severe frontal headache. In a third case general neuralgia of the side affected appeared every third day, only to be relieved when pus began to flow from the nose. When pain was not actually complained of it could sometimes be elicited by gentle percussion over the malar or nasal bones; sometimes the patient would complain that the pain thus induced would radiate along the alveolar border towards the ear. Passing on to objective symptoms, the speaker remarked that they were sometimes extremely difficult to determine positively. Usually pus lying in the concavity of the middle turbinated body was sufficient evidence of the presence of pus in the antrum. But, where, as for instance, in both the cases of supra-orbital pain mentioned above, pus was flowing also from above the middle turbinated and observed lying between that structure and the septum, he considered it sufficient evidence of the co-existence of disease in the ethmoidal cells; and such cases in his hands had proved the most intractable. Along with pus lying in the regions indicated, there were not infrequently evidences of caries of the bone in the same neighbourhood, accompanied by enormous masses of cedematous granulations which were generally designated as mucous polypus. Dr. MacDonald considered that speaking without pathological accuracy, that wherever we found nasal polypus accompanied with suppuration, it afforded the strongest evidence of the presence of pus in the antrum. He attributed the difference of opinion as to ætiology mainly to the failure in appreciating this fact; and he strongly suspected that a great number of instances were thus overlooked. In doubtful cases he held it quite justifiable to make an exploratory puncture either through the nose or alveolus for the purpose of diagnosis. For purposes of treatment he considered the alveolar opening preferable, even though it might necessitate the sacrifice of a sound tooth; though this was a matter he always left to the dentist for decision. In one case in which Dr. MacDonald had made an opening through the inferior

meatus at the earnest request of the patient, very severe bleeding had occurred, a contingency likely enough when we remembered the spongy venous structure that for the most part lines the inferior meatus. Further difficulty had occurred in this case in the impossibility of keeping any sort of drainage tube *in situ*, and ultimately it had become necessary to make an opening into the antrum in the more approved manner.

Mr. David Hepburn said that there was one point of practical import in treatment which he proposed bringing before the Society. When the alveolar opening into the antrum was made it was necessary to arrange the opening in such a way that it was readily accessible for syringing out the cavity. In the last case of antral abscess which had fallen under Mr. Hepburn's care, he had, after extracting the tooth to open up the antrum, replaced it by a vulcanite tooth; he had then drilled out the crown of this making an infundibuliform opening into the antrum. The patient could himself by running the nozzle of his syringe along the line of the teeth easily feel the aperture and so syringe out without trouble or difficulty. Another advantage of this contrivance was that it was so easy to plug the aperture in the tooth, and by inserting a little pledget of iodised wool after washing out, to maintain the cavity sweet and avoid the trickling of pus into the mouth.

The President said he might supplement Mr. England's remarks by stating that after opening the antrum in the way described by him they usually inserted a plate with a tube attached, so that the tube entered the aperture into the antrum. There was a further point in diagnosis which was of importance and to which he might refer before calling upon Dr. Semon to reply. It had been illustrated by the first case which he had seen in consultation with Dr. Semon. The patient had no carious teeth, but had an upper molar containing a large filling as well as a palatine root well filled but absorbed, so that although from the surface there appeared no way for pus to enter the antrum, yet it could do so around the absorbed root.

Dr. Semon, in replying, said the question of how common a disease antral empyema was could not be decided either by the surgeon or the dentist, as different types of cases went to them. Thus, so long as a patent ostium maxillare existed the patients went to the dentist, but when it became closed they drifted to the surgeon. In reference to the neuralgia sometimes present in these cases, he pointed out that it was

usually situated over the frontal sinuses, and pain in that situation must therefore be carefully considered before a diagnosis could be finally made. The question of opening was an important and difficult one to decide. Undoubtedly when possible it was better to do without any opening, but when one was made the alveolar one was, he thought preferable, as that through the nose was liable to produce hæmorrhage. As to openings in mucous membranes healing up too quickly, there was no fear of that, for the nasal openings were very slow to heal. Referring to chronic cases, Dr. Semon advised if the simple alveolar opening failed to produce a successful result, that a counter opening should be made through the nose and syringing right through be practised. The antrum being a cavity lined by mucous membrane there was a danger of iodoform poisoning if that agent were used too freely for stuffing or syringing, and Dr. Semon therefore suggested caution in its use.

The President having put the usual vote of thanks, which were duly honoured by the Society.

The meeting then adjourned.

STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

ORDINARY GENERAL MEETING, held December 9th, 1889, at 8 p.m. William Hern, Esq., President in the Chair.

The Minutes of the previous meeting were read and confirmed.

Messrs. Blaine, Carter, and Goddard signed the Obligation Book, and were formally admitted to the membership of the Society.

Mr. Porter proposed that Messrs. Van der Pant and Blaenberg be elected members of the Society.

Messrs. Gask and Reading were chosen as Auditors of the Society's accounts for the past year.

The President then read the list of members recommended by the Council as officers for the ensuing year. This was as follows :—

President—Mr. Leonard Matheson. *Vice Presidents*—Messrs. J. F. Colyer and F. C. Porter. *Treasurer*—Mr. E. Preedy. *Hon. Secs.*—Messrs. F. A. Harsant and Mr. George

Hern. *Curator and Librarian*—Mr. E. Briault. *Council*—2nd year ; Messrs. W. R. Barrett, E. Bull, G. Forsyth, W. May, Schelling, Holford, Cormack. 1st year ; Messrs. Barnes, Coysh, Goddard, Humphreys, Gardiner, Hall.

It was proposed and seconded that the names of Messrs. W. S. Holford and D. Cormack be added to the list of 2nd year's students, and those of Messrs. Gardner and Hall be added to the list of first year's students.

On Casual Communications being called for, Mr. Cormack presented a left lower third molar having a supplemental cusp and four patent nerve canals.

Mr. Harrison exhibited a new appliance for putting on the rubber-dam.

Mr. W. May showed a supernumerary tooth, which he had removed from the region behind the central and lateral. After having been erupted about five years it had suddenly given pain, and was removed. The root was partly absorbed though there was no pressure on the tooth.

Mr. Harsant showed a piece of bridge-work, to which the following history was attached :—The patient, whose front teeth were prominent and unsightly, had had the four upper incisors extracted, and the crowns of the canines cut off. A bridge-plate was then put in, supported by a cap over the second molar on each side, and a cap and pivot over each canine root. This, becoming loose soon after, was refixed. Having the misfortune to break two of the teeth a few months after, and finding that the piece would have to be removed to be repaired, the patient was tired of the "American system," and sought the advice of Mr. Harding. He advised her to have the other roots, which were tender and slightly loose, extracted and have a fresh plate. The piece was so firmly fixed, however, that Mr. Harsant had to saw it through in three places, and remove the pieces *in situ* and attached to the teeth. Even after removal he could not separate the caps from the roots.

A discussion arose upon the case, in which Mr. Matheson, Mr. Dolamore and the President took part.

The President then called on Mr. D. Cormack for his paper on "The Treatment of Pulpless Teeth."

The discussion was opened by Mr. Wrighton. His mode of treatment for dead teeth was first to rinse out the cavity and pulp chamber with an antiseptic, and then employ the dry method of dressing. He used a solution of iodoform in ether. The ether quickly vanishes and leaves the iodoform

dry in the root. He believed that iodoform and wax dressings lasted much longer than Mr. Cormack had stated. He had found them unchanged after two years. An economical way of opening up cavities was to cut the enamel through with a corundum disk, and then drill through the dentine with steel burs.

Mr. Marshall narrated the case of a tooth he was called upon to extract, because of severe alveolar periostitis, consequent on, he believed, the passage of strong perchloride of mercury through the apical foramen. He advocated the treatment of abscessed teeth by drilling through the alveolus over the root.

Mr. Rilot differed from Mr. Cormack as to the rarity of septic matter passing through the apex, and congratulated Mr. Cormack on his apparent exemption from this misfortune. He himself would reverse the writer's order of procedure in treating teeth, he would use antiseptics first and drill out the roots after. It was important to open up the cavity well, so as to be able to get a drill straight up. He had found iodoform dressings last much longer than was supposed, in one case as long as six years. Referring to the different materials which are used as root fillings, he said that we must choose our material in accordance with the requirements of each individual case. A remarkable case had recently occurred in the Hospital where Mr. Bennett had removed from a tooth a plain wool dressing in a sweet condition after having been in the tooth for 4 years.

Mr. Schelling preferred when he had filled the end of the pulp canals with wax and iodoform, to cap this with osteo or some similar material, so as to obviate the possibility of the iodoform leaking into the mouth.

Mr. Porter thought that in order to be able to treat dead teeth scientifically each man ought to have a knowledge of the phenomena of inflammation. The pulps of teeth might die as the result of a blow. A patient had recently come to the hospital with a dead central. No cause for this lesion could be discovered till the patient admitted that she had walked in her sleep and had knocked her head against a mantelpiece. In some cases there was more danger in trying to force a drill up a root than in leaving it. The best way to remove a pulp was to pass up a bristle slightly bent at the end. This would sweep round the canal, if rotated, and often bring down the pulps of ten whole. Seeing that periostitis sometimes commenced so soon after arsenic had been applied to a

pulp, was it possible that the drug passed straight through the dentine?

Mr. Gask asked Mr. Cormack why he had omitted to treat of Rhizodontrophy in his paper?

Mr. Knowles had found the nerve-destroying fibre, sold at the depots more effective than plain arsenious acid. A good way to remove a piece of drill broken off in the nerve canal was to seal in some Hydrochloric acid, so as to rust the iron away.

Mr. Preedy had recently extracted a tooth some time after it had been filled, which though firm, had given constant pain. The roots were well filled, there was neither perforation, exostosis, or absorption; he thought some septic matter must have been forced through the apex. He objected to Rhizodontrophy, since the breath was apt to become tainted thereby.

Mr. May advocated the use of drills as large as possible, so as to cut away all the infiltrated dentine round the canal.

Mr. Briault, in reference to lead fillings for roots, asked if the metal had any antiseptic properties?

The President was surprised that Mr. Cormack had not divided his subject, at least into two parts, treating (1st) of teeth in which the pulp has been destroyed by the operator, and (2nd) of those in which the pulp is dead before treatment is commenced. The after-treatment of these two classes differ widely. All cavities should be well opened up and the orifices of the canals funnelled out. The object of treatment was to get as near asepticity as possible, though we could never arrive at a perfectly aseptic condition. As he had mentioned at a previous meeting, we should be very careful at the beginning of the treatment using only naked instruments up the roots.

Mr. Cormack then replied to the speakers.

The President then tendered a vote of thanks to Mr. Cormack, and to the gentlemen who had brought forward casual communications. The next meeting would be on the 20th of January, 1890. This was the Annual General Meeting, and at it Mr. E. Preedy would read a paper on "The Implantation, Transplantation and Replantation of Teeth."

The proceedings then terminated.

Dental News.

LEGAL INTELLIGENCE.

PARTRIDGE *v.* THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.—In this action the plaintiff sued the defendants, who are a quasi-judicial body taking their powers under the Medical Act (21 and 22 Vic., chap. 90), to recover damages, alleging that they had wrongfully and maliciously caused his name to be taken off the Register in June, 1886, and to remain off until ordered by writ of *mandamus* to reinstate it in September, 1887, and that during that period a number of his customers had refused to pay their accounts on the ground that under the Dentists' Act, 1878 (41 and 42 Vict., chap. 38), the plaintiff's name not being upon the Register, he could not at law recover his fees. The defence was in substance that the defendants, as a judicial body, had had certain matters connected with the plaintiff's professional conduct brought before them to decide, and that although the Court of appeal had decided that their decision had been wrong, yet it was arrived at *bona-fide* and without malice, and that, therefore, they were not liable in damages to the plaintiff for their mistake in exercising their discretion.

Mr. Waddy, Q.C., and Mr. Lyon were for the plaintiff; and Mr. R. T. Reid, Q. C., and Mr. Muir Mackenzie appeared for the defendants.

Mr. Waddy opened the case, and called the plaintiff, Mr. H. F. Partridge, who said he practised as a dentist at Sussex House, Sussex-place, Old Brompton-road, and had done so for twenty years. In 1878 the Dentists' Act was passed compelling registration, and so he wished to become a Licentiate in Dental Surgery of the Royal College of Surgeons in Ireland. Witness went to Dublin, and passed the required examinations, and received a diploma, at the same time signing a declaration that while he held it he would not advertise in order to benefit his practice as a dentist, under the penalty of having the diploma cancelled. In February, 1882, he had gone to bed quite well in health, and awoke the next morning totally blind, and he had been so ever since. In order to obtain a living he had formed the South Kensington Ladies' Dental Institute. He had, in fact, advertised that institution. He had found it

necessary to do so. He had received a copy of the resolution of the Council for Ireland in July, 1885, and a notification that they had again had under their consideration the fact of his advertising his institution, and that his diploma was cancelled. On July 11th, witness replied to that. On June 8th, 1886, he received a letter from the General Medical Council of Education in England informing him that a meeting of that Council "after due and careful consideration, had decided that his name should be removed from the Register." Witness applied to the Court thereupon for a *mandamus* questioning that decision, and in the result the Court of Appeal ordered his name to be restored, and it was, in September, 1886. During the time that his name was off the Register, he had been unable to sue for or recover any fees. His out-of-pocket expenses over the whole matter, including his solicitor's costs, had been £36 odd.

Cross-examined by Mr. R. T. Reid, Q.C.: The institution was wholly his own business, and all its profits his. From 1882 until now witness had constantly and largely advertised, and had advertised himself as an "L.D.S.," as described in the certificate to his diploma. He meant by that to describe himself as connected with the Irish Royal College of Surgeons. He was aware that by his diploma he had undertaken not to advertise. In 1883 the Dublin College complained of his doing so, and in effect he had promised not to do so any longer. Nevertheless he continued to so advertise. He thought that he had a right to use the title of L.D.S., after his diploma had been cancelled. Since he had been struck off the Register he had still advertised as L.D.S. He could not help himself. He did put L.D.S., on his "plate," but with the word "late" before the L.D.S.

Mr. Baron Huddleston: When was it you put the word "late" before the L.D.S.?

Witness: Oh, a few weeks ago.

Cross-examination continued.—During the period you were off the Register was it not a fact that your income had increased?—Yes, that is so, but I ascribe it to the fact that I largely advertised during that period.

Mr. Walter Oldham said he was the plaintiff's secretary since June, 1886. There were only one or two cases where refusals to pay accounts were based on the fact that the plaintiff's name was off the Register.

Cross-examined.—The plaintiff's income increased during the time his name was off the Register.

Mr. R. T. Reid then said that as there was no evidence of malice here, this action could not be maintained.

Mr. Waddy, for the plaintiff, argued that the defendants had gone entirely beyond the powers given them by the Legislature, and were therefore liable in damages, there being in fact legal or constructive malice.

Mr. Baron Huddleston said he might say at once that he was prepared to decide that this action would not lie unless malice were proved, and he would therefore suggest that the jury should be discharged and it be left for his decision, in which event either party could go direct to the Court of Appeal.

Mr. Waddy said his client wished the matter to go to the jury.

Mr. Baron Huddleston : But I will not permit it. I have told you I am going to decide the matter at once.

Mr. Waddy : Then I can say no more, my lord.

Mr. Baron Huddleston then gave judgment for the defendants, holding that there was no evidence of malice on the part of the defendants, and that therefore the action did not lie. In reviewing the facts, the learned Baron observed that the defendants, when the matter of the plaintiff's conduct in respect of the violation of his agreement not to advertise was brought to their notice, had taken his name off the Register, and subsequently, by order of the Court of Appeal, they had to reinstate it. But for this were the defendants liable to an action ? He did not think it required authority to establish that where persons in a quasi-judicial capacity exercised their discretion wrongly no action could be maintained against them for such a decision unless it could be shown that they arrived at their decision maliciously. Here there was no evidence at all of malice, and the plaintiff must therefore be non-suited and judgment entered for the defendants.

BURNS AND HOW TO ALLAY THE PAIN.—Equal parts of Tannin and alcohol mixed with 48 times as much sulphuric ether is said to make a useful application, but perhaps a better one is formed by adding Salol one part to every twelve parts of the old Carron oil equal parts of Limewater and olive oil.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

DEATH WHEN UNDER THE INFLUENCE OF NITROUS OXIDE.

To the Editor of the British Journal of Dental Science.

SIR,—I read Mr. Watson's explanation of the death of Lady Milne in the "British Journal of Dental Science," when under the influence of Nitrous Oxide he administered, fatal results following. By stating that the patient was greatly advanced in years, and that she had fatty degeneration of the heart. This may go to account for the sad occurrence, but surely the readers of the "*British Journal of Dental Science*" require more detailed information on this subject, and which no doubt Mr. Watson will be able, and glad to give—information such as—The quantity of gas that was administered, and how long it took, from the first inspiration of the gas, until the mouthpiece was removed and what test was relied on, in arriving at the conclusion when the patient had inhaled sufficient of the anæsthetic. On all these essential points, we are left in complete darkness, and which are of the greatest importance to be known by the profession, so that the dentist may be enabled to guard against a similar sad and fatal incident.

Yours,

ANONYMOUS.

[While agreeing with our correspondent, that all possible information should be furnished by Mr. Watson, we cannot but feel that unless any facts have been held back, which we assume is not the case, it is not advisable to discuss *ad nauseam* so exceptional an event as a death under Nitrous Oxide. I may be added, however, that a report is current which should be corroborated or contradicted—that Lady Milne was placed under the influence of Nitrous Oxide two or three times during the one sitting.—EDITOR, *British Journal of Dental Science*.]

Hospital Reports.

MONTHLY STATEMENT of operations performed at the Dental Hospital of London, during November, 1889 :—

Extractions	Children under 14	.	.	.	.	.	927
	Adults	.	.	.	.	.	342
	Under Nitrous Oxide	.	.	.	.	.	923
Gold Fillings.	.	.	.	.	.	.	455
Other Fillings	.	.	.	.	.	.	1420
Advice and Irregularities	.	.	.	.	.	.	755
Miscellaneous	.	.	.	.	.	.	80
Total	.	.	.	.	.	.	4902

F. C. PORTER,
T. A. GOARD,
V. KNOWLES,

} *House Surgeons.*

STATEMENT of operations performed at the National Dental Hospital, from November 30th to December 31st, 1889:—

Number of patients attended	.	.	.	.	.	1338
Extractions	{ Children under 14	.	.	.	.	205
	{ Adults	.	.	.	.	356
	{ Under Nitrous Oxide	.	.	.	.	600
Gold Stoppings	.	.	.	.	.	39
Other Stoppings	.	.	.	.	.	206
Advice and Scaling	.	.	.	.	.	295
Irregularities of the Teeth	.	.	.	.	.	57
Miscellaneous	.	.	.	.	.	61
Total						1819

EDGAR A. H. FIELD, } *House Surgeons.*
ARNOLD PRAGER, }

Work done at the Victoria Dental Hospital of Manchester, during the month of November, 1889.

Number of patients attended	.	.	.	.	.	1191
Extractions	{ Children under 14	.	.	.	.	748
	{ Adults	.	.	.	.
	{ Under Nitrous Oxide.	.	.	.	.	136
Gold Stoppings	.	.	.	.	.	44
Other Stoppings	.	.	.	.	.	151
Miscellaneous	.	.	.	.	.	430
Total						1509

CHARLES H. SMALE, *House Surgeon.*

Work done at the Birmingham Dental Hospital, 71, Newhall Street, during the month of November, 1889:—

Males	.	.	.	.	.	116
Females	.	.	.	.	.	170
Children under ten years of age	.	.	.	.	.	154
Extractions	.	.	.	.	.	460
Gold Fillings	.	.	.	.	.	11
Other Fillings	.	.	.	.	.	65
Miscellaneous and Advice	.	.	.	.	.	96
Anæsthetics administered	.	.	.	.	.	21

FRED. R. HOWARD, *House Surgeon.*

British Journal of Dental Science.

No. 529. LONDON, FEB. 1, 1890. VOL. XXXIII.

IMPLANTATION REPLANTATION AND TRANSPLANTATION OF TEETH.*

By Mr. E. PREEDY.

Mr. President and Gentlemen,

My object in choosing Implantation, with its closely related operations of Re- and Transplantation, as the subject for my paper this evening, was not with the hope of being able to throw any new light on the various methods of performing these heroic operations, or to suggest any treatment as yet untried by those who have devoted much time and labour to this section of our professional studies, but rather for the purpose of describing their *modus operandi* and reviewing their interesting histories, to point out the circumstances necessary to ensure successful results, and, by the aid of reliable statistics, draw conclusions as to the advisability of adopting these methods of treatment into our every-day practice of dentistry.

And before proceeding to perform one of the above-mentioned operations in our private practice, it is undoubtedly an important part of our duty as professional men, to candidly inform patients, who have expressed their willingness to submit to the treatment advised, as to the probable and possible results of the operation about to be performed, for nothing can be more strongly deprecated than the conduct of the dental surgeon who points out in glowing terms the results he hopes to achieve, but who neglects to mention the risks and dangers attendant on an operation like Implantation.

REPLANTATION is the operation of replacing a tooth in the socket from which it has been removed, and the ensuing surgical treatment necessary to bring about its connection with the socket as it previously existed.

History.—We have well authenticated records of this operation dating back to the time of Ambroise Paré in the 16th century, and there are good reasons for believing that it was practised long before this time.

* A paper read before the Students Society, London Dental Hospital.

It seems to have been performed as the treatment for no special disease of the dental tissues. Thus, Dupont, in 1683, employed it for the relief of pain : Schelhanmer (died 1716), recommended its adoption where fillings could not be properly performed in the mouth, as did also Fischer and Pfaff.

Bourdet, in the middle of the 18th century, removed a root in order to attach an artificial crown to it, and relates that it was perfectly firm 5½ years after. He also treated some cases of irregularity by means of this operation.

But the majority of these ancient writers do not appear to have regarded the operation with much favour, and the practice of replanting teeth has been compared by a recent author to a protracted case of intermittent fever, a practice which has appeared to entirely subside at certain intervals only to break out again with renewed force and ardour.

More recently, Mr. Coleman, in a paper read before the Odontological Society in 1870, advocated Replantation as the treatment for Chronic Periodontitis, and recorded 14 cases, 9 of which he classed as successful, but 2 only of these had been under observation for six months, and the remainder for shorter periods.

Now-a-days, Replantation is only performed in cases of traumatic dislocation, usually occurring in the incisive region, and provided the patient does not seek the dentist's aid too late, these cases generally terminate satisfactory. One of this class was recently treated successfully by our President; occasionally when other treatments have signally failed, Replantation is resorted to for the relief of continued periosteal trouble, but considering that we are then dealing with diseased tissues, our chance of permanent success is not great.

The operation is very simply performed. After removal, the tooth is rinsed in a warm and weak solution of an anti-septic (the bichloride of mercury, 1-1000 is recommended), and the socket syringed with the same. If the pulp is at all diseased, it is advisable to remove it, the canals being opened up and filled in the usual way, the socket being meanwhile lightly packed with bibulous paper soaked in tincture of iodine. Care should be taken that no roughness exists at the apex of the root likely to cause irritation, and that all diseased periosteum is removed previous to replacing the tooth firmly in its socket.

It is advisable in order to keep it firmly in position to ligature it to the adjoining teeth by means of silk or wire, or

better still to employ a small vulcanite 'splint, which in addition to maintaining the position of the tooth, will protect it from the slight injuries it would otherwise receive during mastication.

A handy little splint can be made by utilising a strip of rubber-dam, applied to the adjoining teeth with floss silk, in the usual way, and extending over the cutting edge of the replanted tooth, which in addition to keeping it firm, produces an upward pressure.

Subsequently great attention should be given to cleanliness, and the patient directed to frequently rinse the mouth, especially after meals, with a mouth-wash possessing both antiseptic and astringent properties.

TRANSPLANTATION is the operation of transferring to a socket of one person a tooth removed from the alveolus of another.

Historically considered, it is curious to note that this operation was more frequently practised than that of Replantation, and this is probably due to the extensive field of gain it offered to the unscrupulous quack, who induced his patients, for large fees, to part with their carious incisors in order that their personal appearance might be bettered by the insertion of healthy-looking teeth, usually obtained from the poorer classes.

Some old writers, Wiseman and Dieffenbach, ascribe the priority of this discovery to Abulcasis, who died in 1122, basing their opinions on the following paragraph from one of his works—

"Aliquando, dens unus vel duo postquam exciderint, restituntur in loco eorum et contextuntur uti præcepimus et remanent. Id vero artifex expertus cum lenitate efficiet."

But it is doubtful whether this does not refer to the adjustment of a denture. Ambroise Paré only mentions reports of this operation, but speaks of it with evident distrust, though he appears to have practised Replantation with unconcern.

Berdmore, in 1668, nearly a hundred years after Paré's time, criticises Transplantation with considerable common sense. Saying that "were people properly versed in the dentist's art they would certainly prefer the healing of the socket and the use of a well constructed artificial tooth to the introduction of another man's tooth which must necessarily press on the socket unequally, and therefore occasion considerable pain and inflammation."

Hunter, towards the end of the 18th century speaks of Transplantation as "one of the nicest of all operations, and requires more chirurgical and physiological knowledge than any that comes under the care of the dentist."

He conducted some very remarkable experiments, intended to demonstrate the possibility of preserving the vitality of a tooth, consisting of the insertion of a sound tooth, immediately after its removal from the alveolus, into the comb of a cock, and securing it there by means of ligatures, but though he frequently tried this experiment only once was it successful, and that specimen is still preserved in the Museum of the College of Surgeons; it is a canine tooth, the root of which is not completely formed, and the tissue of the cock's comb seems to have penetrated into the pulp through the large opening at the uncalcified apex.

The operation, as defined above, is almost entirely discarded by the modern practitioner; first, on account of the moral objection, the inhumanity of inflicting pain, and buying Nature's gifts from poor unfortunates, in order to confer an uncertain benefit on one of the richer classes.

A very masterly written description of such an occurrence is found in the first volume of Victor Hugo's splendid novel "*Les Misérables*," where Fantine, the heroine's mother, is induced to part with her incisors to the itinerant quack in order to save herself and child from starvation.

Another objection is the danger of inoculation of disease, though the risk of so doing has been probably much exaggerated. Hunter, however, was fiercely attacked both during and after his lifetime, for having communicated syphilis by means of Transplantation.

In some rare cases of irregularity the transference of, say, a sound lateral erupted within the arch to the socket of a discoloured central is of course justifiable, and has often proved successful.

The Odontological Society possess an excellent caricature of Transplantation, which has been kindly lent me for this evening. It is the work of Rowlandson, and bears the date 1787. In the foreground is seen "a fine lady of fashion" about to have the incisors of the street arab in the adjoining seat, transplanted to her vacant sockets: behind is a gentleman regarding with satisfaction his newly-acquired central, and a little girl is seen leaving by the door, who has evidently just parted with an incisor in exchange for the coin she is holding in her hand.

IMPLANTATION. An operation of more recent date, consists of the preparation of an artificial socket in the maxillary bone for the introduction of a natural tooth.

History. It was, I believe, first performed by Dr. Younger, of San Francisco, in 1881, and has been practised by him since then with some success. He records nineteen successes out of twenty-six cases, after a trial of four years, but such results have not been obtained by other practitioners who have treated far more cases, but Dr. Younger is extremely particular in the selection of his patients, choosing only young and healthy subjects, and teeth which possess a large amount of healthy periosteum. This membrane he believes is capable of retaining its vitality for many months after its removal from the alveolus.

In this country, Dr. Cunningham, of Cambridge, has directed his attention to this operation. He lately recorded sixteen cases, six of which are classed as successful, but nine months was the longest time that any of the patients have been under observation.

The operation is thus performed, a tooth having been selected corresponding in size and shape to the teeth adjoining the space about to be filled. It is immersed in a warm solution of an antiseptic (Bichloride of Mercury. 1-1000 at 100 F). Attention is then directed to the preparation of a socket; first a crucial incision is made into the gum and the four resulting flaps are reflected, large graduated drills rotated by the dental engine are then applied to the maxillary bone and a cavity formed corresponding to the root of the tooth about to be implanted, which is then inserted and secured in the usual way. The operation is said to be comparatively painless, scarcely approaching that of an ordinary extraction.

Various modifications of this operation consisting of the introduction of crowns made entirely of metal, and metal roots for the subsequent adoption of crowns, have recently been advocated, but such experiments, so contrary to surgical principles and apparently introduced for the object of attracting attention or with the hope of cheating nature, need not be discussed here.

The operation is not without danger; severe neuralgia might be induced by the perforation of the anterior palatine canal when forming sockets for central incisors, and serious complications have been known to arise from penetrating the floor of the antrum, when preparing for the insertion of a bicuspid.

Taking into consideration therefore the difficulty and painful nature of the operation, to say nothing of the attendant dangers and the chance of success shown by statistics, one does not feel justified, save for the purpose of experiment, in performing implantation, but perhaps further investigations will result in reducing the per centage of failure in an operation which has only been practised during the last few years.

Before concluding I should like to say a few words on the causes of failure, and the manner in which union between the tooth and socket is brought about after these operations.

CAUSES OF FAILURE.—On examining unsuccessful cases of Re-, Trans ; or Implantation we find that loss of the tooth is nearly always occasioned by absorption. The root being roughened by the typical semilunar excavations of osteoclasts, and I believe the great cause of these failures is the difficulty we experience of keeping the implanted tooth in position, we know that in the practice of general surgery when treating a case of fracture, the great essential to success is perfect rest and abstention from movement of the injured part, but unfortunately, in the mouth, this is impossible, some slight movement must occur during mastication, and the sudden changes of temperature to which the buccal cavity is subjected by the imbibition of hot and cold fluids, must greatly interfere with the process of repair we are endeavouring to establish.

There is considerable disagreement as to the possibility of obtaining a union of the vessels and nerves forming the tooth pulp with the trunks from which they have just been separated when healthy teeth are immediately replanted.

UNION AFTER REPLANTATION.—On examining the small size of the apical foramen in an adult tooth it seems impossible that it can be replaced with such exactness that the recently divided vessels will be in apposition, but as Mr. Underwood has pointed out a re-establishment of vitality may be produced by collateral capillary circulation and he cites two cases where, after immediately replacing two incisors removed for irregularity, at the end of a period of 3 years they were indistinguishable (though carefully tested as to colour, sensibility, &c.) from their healthy neighbours.

Wiseman replanted a tooth in a dog some minutes after its extraction, and killed the animal 7 weeks later ; he injected the head and found on dissection a vessel of no small size, filled with injection, passing into the pulp and there dividing into

two branches, this specimen is still preserved in the Bonn Museum.

And the experiment of John Hunter just referred to proves that such union is not impossible, though difficult to obtain.

But in the case of children's teeth where the apex of the root is not yet completely formed and there is consequently a great amount of active tissue formation progressing, the re-establishment of nervous and vascular connections is by no means improbable.

UNION AFTER TRANSPLANTATION.—Now in the Transplantation of a dead tooth to a healthy socket,—union, if accomplished, is brought about by an entirely different process.

First the root becomes attacked by absorption, then bony tissue is formed, which extends into the semilunar depressions caused by the action of osteoclasts and thus an osseous attachment is effected.

Such an union, was I believe, first observed by Mitscherlich, who inserted a tooth recently extracted from one dog into the socket of a corresponding tooth in another. and he found on subsequent microscopic examination a complete bony union had taken place so that the tooth was held remarkably firm.

This is not so improbable as it at first seems, for we know that after a tooth is removed, the socket becomes filled with a new formation of bone, termed callus, as is seen on examination of a skull where one or two teeth only are missing. The alveolus preserves the same level at the vacant space as it does where teeth are present.

Absorption does not precede osseous union in every case, through evidences of its action are usually present, nor is a bony attachment always formed, and those cases which fail, after remaining tolerably firm for a few months, appear to be adherent by fibrous attachments only.

UNION AFTER IMPLANTATION.—And a similar process of repair by ossific deposition is said to occur by the advocates of Implantation where an artificial socket has been made, and the writer of an article which recently appeared in an American Dental Journal demonstrated such an union by means of photo-micrographs of sections of an implanted tooth.

Absorption, I presume, would be brought about by the presence of osteoclasts in the marrow of the cancellous bone of the alveolus, or as the result of an effort of nature to expel a foreign body; and osseous material would be developed, independent of the existence of the periodontal membrane, in

the same way as union of fractures is effected, by an exudation of fibrinous material which subsequently becomes transformed into bone by the intramembranous process of ossification.

But the existence of this newly-formed osseous deposit on an absorbed surface does not prove its permanency or ensure its protection from the destructive power of osteoclasts, for we find alternations of deposition and absorption on the roots of temporary teeth which have been retained beyond their normal period of function, and the varying success which has attended the operation of Implantation, would seem to justify our considering these processes, so histologically similar, as analogous.

In conclusion, let me thank you for the attention you have shewn in listening to a paper of such little practical import, and proffer my apologies for introducing as a subject, operations, the performance of which, I cannot strongly advocate.

CARE OF DECIDUOUS TEETH.

By F. S. MAXWELL, D.D.S., Steubenville, O.

A SUBJECT of so grave importance as this, one should take pride in presenting to a dental society for its discussion.

We all know how much good can be obtained by a due consideration of the subject, and for this purpose I write, hoping it may provoke a general awakening of interest in the right direction.

It must be surprising to all that so little has been written concerning the care of the temporary teeth, inasmuch that we agree, or should agree, as to their importance. We know that it has only been of late years that they have received any consideration relative to their preservation, but why they have escaped the dentist's care so long remains a mystery.

Perhaps the deciduous teeth of the children of to-day are not as free from decay and disease as they formerly were, and I firmly believe it, and for that reason have never received that proper care heretofore that they are now receiving; however, there is a large field for the care of them alone, at the present time, in which field we should all embark to a considerable extent.

To begin with : a prospective mother should be taught her duty in regard to the welfare of her offspring. She should be taught of what her system is composed, what effect it has upon her unborn child, what that child derives from her, and what she should make provision for by her diet. Lime, phosphorus,¹ potash, silex, etc., of which the teeth are composed, should be taken in suitable quantities, both for the preservation of her own and her child's teeth ; and when I say they should be taken in suitable quantities, I mean, by the taking of food containing those important substances, such as wheat, milk, eggs, and vegetables, necessary to produce strong flesh and teeth.

What kind of teeth can you expect in a child in which it and its mother exist on starches and sugars alone. A *little* sugar will do no harm, and it must be pure, but a little does not go far toward forming strong enamel, and they would be better without it altogether. We have all noticed in most mother's mouths, after child-birth, that pearlsh white line or groove, at the gum margin, that could have been prevented to a considerable extent by the free use of lime-water during gestation.

They should be taught that the gums of the child's teeth begin to form as early as the fifth or sixth week of foetal life, that the teeth become almost solidified before its birth, and that during lactation the diet should be as equally important a factor in the production of strong and beautiful teeth. What delights a mother more than the appearance of her baby's first tooth and even the succeeding ones, so that if she has followed our advice, her profit is sufficient pay for the trouble taken. Good food means good blood, and all nutritious food taken up by the blood, being assimilated, shows the desired result in the human economy. Too much stress, therefore, cannot be placed upon this part of the deciduous teeth.

We hear and read of plenty of methods of preventing and arresting decay, fixing teeth, etc., but for the most part it is for teeth that have been erupted, and but little new can be said in that direction ; a little, however, is a step forward.

The first and utmost thing is to impress the importance of cleanliness. A child, ever so small, can be taught the usefulness of a small, soft tooth-brush. The temporary teeth, to them, are as important as the permanent to the adult. Much pain can be saved with but little effort, by the proper use of the brush, and an occasional rinsing of the mouth with lime-

water. When they have grown a little older give them a small quill tooth-pick to use, and you will soon see the habit becoming a permanent one.

The deciduous teeth should be filled as soon as decay makes its appearance. But what should they be filled with? Much depends upon circumstances. A child enters your office with the terrible dread of being hurt—some friend has told her “it would almost kill her”—generally for the first time accompanied by her mother; I would frequently prefer the mother to remain at home. She enters the chair with a feeling of great fear and hesitancy, and, “poor little innocents” look upon the operation, whatever it may be, as a case life or death. Assure them that you are not near as dreadful a man as you have been pictured, by an explanation of the different instruments brought before them; give them a ride in your pedal-lever chair, a turn or two by way of amusement; it takes time, but time is money. Now use the engine for the first time, they have heard of that. Select a sharp, spoon-shaped excavator, the decay is generally of a spongy or leathery texture, and this is the most suitable instrument for removing it, and rose-head burr for smoothing the edges. If the cavity be simple, it will soon be ready for the insertion of an amalgam filling, and the child will feel grateful, and will have satisfied its curiosity.

Do not fill more than one cavity at a sitting; they prefer to come oftener and for a short period. But, suppose this child has been crying for several nights with toothache, an exposed or irritated pulp, and seeks your office for relief? What will you do? Remove the loose decay. Place a small pledget of cotton saturated with oil of cloves, and secure with cotton saturated with gum sandarach. If you have been successful in treatment, in a day or two cap with oil of cloves and oxide of zinc, and over that place a thinly mixed phosphate filling because of its being the easiest to insert without producing pressure. On the other side of the mouth you find its companion,—the child says it formerly ached, but does not now give any trouble.

You most likely discover an abscess at the end of a root, dead or devitalized, deciduous teeth are prone to abscess. What will you do with it? Will you fill? Certainly. Cleanse the cavity of carious dentine and foreign matter, for the chances are it is alive with “germs,” exposing the root canals. Wash out with peroxide of hydrogen until no effervescence is noticed, or odour perceptible. Place oil of

eucalyptus and iodoform in the canal, or canals, and allow it to remain for three or four days without changing. More harm is done by too much treatment than too little, and if the tooth has been comfortable during that time, fill at once with chloro-percha, or gutta-percha, using care not to force it through the naturally large foramen, and cover with whatever desired. In a deciduous tooth, more care should be taken not to force a foreign substance through the foramen, than is necessary in the permanent, for obvious reasons. The eucalyptus oil saturates the root corners and dental tubuli by virtue of its diffusive properties, and enough remains in the canals to force with chloro-percha to the ends of the roots, drying up the fistulous opening and preventing, materially, subsequent trouble.

You notice that I use the essential oils in the treatment of the deciduous teeth. I believe they are the best medicines brought to our notice for that purpose. Some capping will not *save*, in your judgment, how will you destroy the pulp? Strangle it with two or three applications of pure carbolic acid. I have used arsenic to destroy, and prefer not to in a majority of cases. Remove the pulp with small barbed broaches and fill as before.

There is no trouble, gentlemen, in succeeding with children if we but approach them properly. Treat them tenderly, be patient, delicate in touch, sympathetic; apparently gain their esteem by kind words, and your path is made much clearer. There is nothing more satisfactory to the mother, child, or yourself than the successful care and treatment of the child's teeth. Be thorough in your work, earn their confidence, by your sound advice and good judgment, and you will be amply repaid by the good results shown and by their subsequent patronage.

ETCHING LIQUID FOR STEEL is made by mixing 1 ounce of sulphate of copper, $\frac{1}{4}$ of one ounce of alum, and $\frac{1}{2}$ teaspoonful of salt reduced to powder, with 1 gill of vinegar and 20 drops of nitric acid. This liquid may be used either for eating deeply into the metal or for imparting a beautiful frosted appearance to the service, according to the time it is allowed to act.

British Journal of Dental Science

LONDON, FEBRUARY 1st, 1890.

THE DENTAL SECTION OF THE APPROACHING INTERNATIONAL CONGRESS.

WE PRINT in another column the particulars of the International Medical Congress, which will be held in Berlin during August of the present year. The importance of the matter to dentists is not slight. A special section inaugurated under the auspices of leading spirits has been established for the consideration and discussion of Dental and Oral Surgery. In modern days a journey to Berlin is as nothing, and its city and environs furnish an ample excuse for a holiday tour, while unless indications are unreliable, the Dental Section will afford abundant material for profitable professional gleanings, both in the matter of papers and demonstrations. It seems likely that Berlin will be made the rallying ground for both European and Trans-Atlantic members of our profession, so that those who were unable to attend the congresses held in America will have the opportunity at Berlin of seeing and studying the latest developments. We are assured that the Congresses are of the greatest utility. They afford opportunity for the interchange of ideas, they keep men in touch with all that is novel and serve as a stimulus to the production of improvements, and the perfection of method. In the matter of criticism they also subserve a useful end. They afford an opportunity of investigating the vaunted modes of manipulation, and much lauded appliances, only too often to the proving that the methods and the appliances are alike valueless, save for advertising purposes,

and that the men who have fathered them, have been actuated by notions not altogether creditable in professional men. The particular line in which the deliberations of the Congress are likely to travel cannot at present be foreshadowed. An English staff of officers in connection with the Oral and Dental Section has been arranged for, and will comprise well known names. The Congress itself opens in August, and at this same time of year most dentists have deserted waiting-rooms and have the opportunity for taking their annual holiday. Few we think will regret following our advice, and arranging for a trip to the capital of Germany; but like all other matters, to ensure comfort some little prevision and arrangement are necessary. An early application should be made to the local secretary about routes, rooms, etc. But not only should we go over to Berlin as auditors, but as contributors to the discussions and demonstrations. It becomes the duty of Englishmen to vindicate the fact that not only have they the best and indeed only satisfactory dental curriculum in the world, but that their work and professional attainments stand favourable comparison with that of any other nation in the world.

CAUSES OF NEURALGIA.—The following sensible editorial comes from the *Leeds Mercury*: It is a matter of wonder to many that neuralgia should be such a common malady now-a-days, whereas no one had heard of it some thirty years ago. There are common-sense methods of accounting for some of it which may possibly be resented by a contingent of the patients. Quite half the neuralgia that is complained of is nothing more nor less than toothache, but the latter is an inconvenient name to give it, involving visits to the dentist, and the possible extraction of faulty teeth. The dentist's chair, like conscience, doth make cowards of us all; and though some of us prefer to brave its terrors and get rid of our enemy at once, there are others who hide behind the veil provided by the convenient word "neuralgia," and endure months of intermittent suffering rather than face that awful chair and the dreadful array of steel instruments that lie on a

table near it. All the same, that chair is a true friend, and skill developed in modern dentistry is a subject of gratitude to those who have experienced the blessed release from pain that it affords. Another fruitful cause of neuralgia is to be found in certain hair-dyes, powders, and cosmetics, which are called "harmless" by persons interested in having them considered so. Permanent brain mischief has been known to result from the constant use of hair-washes containing lead; and if the fact were more widely known, fewer people would run the terrible risk involved in the use of these deadly preparations.

THE USE OF CRYSTAL GOLD.—Dr. Darby, writing in a contemporary, says: My experience with crystal gold has taught me the following: That it should be used in moderately small pieces, and with blunt-pointed instruments with shallow serrations. That in cavities difficult of access, because of the close approximation of adjoining teeth, it is contra-indicated, inasmuch as there is a tendency for it to break into pieces or crumble in the attempt to introduce it. That when used with care there is no greater liability of imperfect adaptation or discolouration of the tooth than when foil or other preparations of gold are used. That surface discolouration is not more frequent than by the use of other gold, and that when it does occur it is not because of any adverse conditions inherent in the gold. That it is specially adapted to large operations where the restoration of contour or great hardness of surface is desired. That with a given amount of time and labour, better operations can be made with this gold than with any other with which I am familiar. After having said so much in favour of Watts's Crystal Gold, the reader may infer that I use it to the exclusion of all others which, is not true. I find it most useful in finishing filling, and in cavities easy of access where large or broad-pointed instruments can be used to advantage.

HERPES ZOSTER OF THE MOUTH AND GUMS.—Herpes Zoster of the mouth and gums, says the editor of the *Dental Review*, presents itself as an acute circumscribed inflammatory disease, characterized by an eruption of vesicles of herpes on a red inflamed basis ; vesicles which are disposed in groups and follow the group of the adjacent nerve, this eruption is preceded and accompanied by a very severe neuralgia of the fifth nerve. The evolution of the disease can be divided into two periods : 1st, a period of invasion, 2nd, a period of eruption. The period of invasion lasts three days and is accompanied by a marked fever and other general symptoms ; it precedes the eruption. There is also this very severe neuralgia of the whole fifth nerve. On the third day we have the period of eruption. The involved parts become excessively sensitive to pressure, and on the red mucous membrane can be seen series of little groups of vesicles, the size of a millet seed. The neuralgia which up to now had involved the whole fifth nerve, became localized to the diseased region. This eruption lasts about three weeks to one month and the pain is persistent. It is a rare affection ; in a period of the years only two cases have been observed. In the first one the eruption was situated on the inside of the right cheek and extended under the form of a ribbon parallel to the direction of the upper teeth ; for the distance of an inch and a half in length, and half an inch broad. In the second instance, the eruption was located on the right external region of the gums of the lower maxilla, beginning at the right inferior cuspid, extending as far as the second molar on the same side. The affection is probably of infectious origin and is due to a neuritis of the affected region which brings on trophic changes. The treatment is a palliative one ; cotton-wool placed between the cheek and teeth, to prevent friction, and on it can be placed an ointment containing cocaine and morphine.

GOLD TIPS.—In making tips for abraded teeth, to lengthen them, or to avoid pulp-exposure by abrasion, the method which Dr. Jackson advocates in the *Cosmos*, is to take pure rolled gold, about 480 foil ; cut a piece a little larger than

the face of the tooth to be tipped ; place it on the tooth with a piece of erasing rubber over it ; let the patient bite hard on the rubber ; anneal the gold and repeat the bite. In very uneven surfaces, he sometimes has to use a small piece of elastic rubber underneath the erasing rubber. This gives a perfect swage. Cut a piece of solder (20 k.) the size of the swaged gold ; lay it on a strip of the gold you use for your tip ; lay the swaged gold on the solder and fuse the solder. If proper care has been used, you will have a perfect-fitting tip. Drill two or three holes through the tip in positions to pass between the pulp and periphery of the tooth on a line with the axis ; in these holes put platinum pins and solder. Trim as near as may be to the form you wish it when finished. Cement to the tooth, burnishing the edges well, then grinding and polishing to the finish. Any thickness can be built up that is desired. With proper care you will have a substantial tip that will last many years. He put one on in 1871 that the patient wore until he died this summer. Many others since have proved equally satisfactory. Years ago he used thin platinum instead of gold, but he discarded it on account of the colour.

COCAINE HALLUCINATIONS.—MM. Magnan and Saury report three cases of hallucination due to the cocaine habit. One patient was always scraping his tongue, and thought he was extracting from it little black worms ; another made his skin raw in the endeavour to draw out cholera microbes ; and a third, a physician, is perpetually looking for cocaine crystals under his skin. Two patients suffered from epileptic attacks, and a third from cramps. It is important to notice that two of these patients were persons who had resorted to cocaine in the hope of being able to cure themselves thereby of the morphine habit, an expectation which had been disappointed. For more than a year they had daily injected from one to two grammes of cocaine under the skin, without, however, giving up the morphine injections, which were only reduced in quantity. The possibility of substituting cocainism in the endeavour to cure morphinomania is a danger, therefore, which must be carefully held in view.

Abstracts of British & Foreign Journals.

INTERNATIONAL DENTAL JOURNAL.

A SUGGESTION.

BY THEODORE F. CHUPEIN, D.D.S., Philadelphia.

THE following suggestion regarding natural tooth crown substitutes may meet an emergency in some cases. The writer terms it the "natural crown," as it is made from the crown of a natural human tooth. It sometimes happens that good teeth are extracted, which are free from any trace of decay, to relieve a crowded condition of the dental arch; but even should the crowns be decayed, either slightly or extensively, this will be no impediment to the operation, as the decayed places may be filled or contoured either with gold or amalgam, and serve as substitutes for lost tooth crowns. For facility of description he takes a typical case,—an upper molar. The remains of the crown are filed or ground down flat or level, a little above the margin of the gum. The roots are seamed out, treated and filled, and the pulp-chamber prepared. The crown of an upper molar, of the proper size and side, is selected, filled and contoured in its decayed places, if the selected tooth has decayed places, and sawed off at its neck. The pulp-chamber of the crown is likewise prepared by properly seaming and undercutting with suitable engine-burrs. Such of the natural teeth as come into our hands by extractions should be submerged in *strong brine*, or perhaps preferably in a jar of alcohol. If permitted to become dry after extraction, they get so brittle that little can be done with them in cutting, scraping, or seaming them for filling. When the root and crown are prepared, as described, the pulp chamber in the crown is filled with wax, so that a little of the wax protrudes from it, sufficient to fill the pulp-chamber in the root. With the help of the wax to hold the crown in position the crown may be properly articulated by grinding away with corundum wheels in the engines at such points as are indicated by the occlusion. This being accomplished, the crown is filed down at its neck, about the thickness of cardboard, or a trifle more. A piece of eighteen carat gold

plate, about twenty-eight or thirty guage thickness, and of a size that will amply cover the neck of the crown is punched or drilled at points about one-thirty-second of an inch apart. The holes are then countersunk. A piece of wire, bent like a staple, is passed through these holes and soldered to the plate, with two minute pieces of solder just sufficient to fill the countersunk holes, the protruding ends of the wire are bent so as to form another staple on the other side of the plate, and soldered also. The plate, as thus constructed, is filled to the proper size, as indicated by the size of the neck of the crown or root. The root is now well dried, and the proper provisions made for the exclusion of moisture. The pulp-chamber of the root is filled with zinc phosphate cement, and a little of the same placed on the root and kept in close contact and proper position, until the cement hardens. The pulp-chamber, in the crown, is then filled with cement, and a little placed within the loop on the plate, when it is carried to its position. After the cement has set the operation is completed by scraping off such small portions of the cement as may have oozed through the root and plate and between the crown and plate. There is nothing to show that this substitute differs from a natural tooth-crown except the line of the gold showing the plate which binds the two parts together.

PREPARATION AND FILLING OF ROOT CANALS.

By G. F. Root, D.D.S., Philadelphia.

He commences with the consideration of devitalization and removal of a living pulp. The methods now in use are (1) escharotic agents, and (2) mechanical extirpation. The latter is an operation that presents numerous difficulties and objections, owing principally to the reluctance of patients to stand the pain, and the inability in many cases of obtaining free access to the canals. To perform the operation, first obtain a free opening into the canal, and then, by passing a broach with a sharp barb quickly to the apex, between the pulp and tooth, rotate several times, whereupon the pulp can be withdrawn. The operation should only be performed in extreme cases, *e.g.* lack of time, or with a pulp more or less benumbed or deadened to pain. Another way advocated by some operators, is done by sharpening a stick of wood to as near the size of the canal as can be judged, and, after dipping it in carbolic

acid and having the pulp freely exposed, driving the peg of wood through the tissues of the pulp into the canal with a sharp blow of the mallet; and when the peg is withdrawn the pulp comes away with it, or, if it should not, it can easily be removed with a broach. Operations should be performed with the least possible pain, he therefore opposes extirpation, except in extreme cases. Arsenic is the escharotic agent most often used in combination. It is the quickest. Of several obtundents tried in connection with the arsenic, arsenic and sulphate of morphia (equal parts) is the best. Dr. Kirk's preparation of cocaine with the arsenic has given little success. It is important, before applying the drug, to reduce as far as possible the irritated condition usually found when first we see the case. One application usually is all that is required, but sometimes it is necessary to make several before devitalisation is complete. He generally allows from 24 to 72 hours for the first application to take effect. If within the course of 24 hours the patient should have severe pain, lasting 2 or 3 hours, the pulp can be removed at the end of the first 24 hours, but with very little pain, but if there should be no complaint of severe toothache, it will usually take the full 72 hours for the devitalisation to be complete, and frequently it will require one or more applications of arsenic. Of course, it is not absolutely necessary to have pain in a tooth before devitalisation takes place, but in a large majority of cases you will find there has been more or less pain before the pulp dies. Very often the pulp will be only partially dead, sometimes in one of the roots of a tooth and not in others; or it may die only part way down the canal. In such cases he removes the dead portion, stops any hæmorrhage that may occur, and reapplies, arsenic; and so on at each sitting until satisfied that all the pulp is removed. He has found Donaldson's nerve-broaches or bristles the best instruments to remove pulps by running them down the canal between the pulp and the tooth to the apex, the same as in extirpation only we do not have to be so quick, and then by twisting several times the barbs will become entwined in the pulp-tissue and can readily be removed, unless, as we sometimes find, the pulp is very much softened and disintegrated, and we have to remove it piecemeal; in such cases it is all-important to remove all the pulp, or else we are sure to have trouble after the tooth is filled; in such cases, after all the pulp possible is removed with the bristles, he usually wipes the canal out several times with cotton entwined on a fine

broach saturated in carbolic acid, care being taken not to force the *debris* through the apical foramen; the particles that will not come away with the bristle will cling to the cotton and be withdrawn with it, thus leaving very little chance for any to remain in the canal. He believes that with very few exceptions, it is far better to insert an antiseptic dressing in the canal, and leave for a day or two, than to fill immediately, for the reason that usually there is more or less hæmorrhage which it is almost impossible to stop at once, and also that very often we have more or less irritation at the apex due to the use of the arsenic, thus lessening the chances for success. He usually uses carbolic acid on cotton for the dressing, as it not only answers the purpose of an antiseptic, but through its coagulating power stops any hæmorrhage that may occur. An application of iodine and tincture of aconite root, equal parts, over the gum, will usually stop any irritation at the end of the root. Referring to dead pulps, he mentions several different kinds (1.) The pulp dead for some time without sign of trouble. (2.) Congestion and irritation at the apex, and others in which an abscess exists; but the preparation of the canal is the same thing in all. After the canal has been freely exposed, if the pulp is not softened and broken up, it can easily be removed by using the same means he recommends as above, care being taken not to force any putrescent matter through the apex in inserting the instrument; but in case the pulp is softened and broken down, and we find nothing but pus and putrefied matter, to take some absorbent cotton or bibulous paper on a broach, and absorb all the fluid possible; then with a broach remove all the *debris*, using the same care as before in regard to forcing anything through the apex, then insert a shred of cotton, saturated in carbolic acid, loosely in the canal, and seal with cotton alone, in order to give free outlet to any gases that may be formed; at the next sitting, after removing the dressing, syringe well with tepid water, and, after drying well, inject peroxide of hydrogen freely into the canal with cotton on a broach; again dry and inject bichloride of mercury solution (one to five hundred); dry again and insert cotton saturated in carbolic acid, this latter to keep the canal sweet and clean until the next sitting. This he repeats several times, until there are no signs of pus or any offensive odour. Where a canal is too small for a broach he enlarges it with a canal-drill, commencing with a small size and then a larger one, and so on; considerable care is required to prevent drill-

ling through the wall of the tooth, but only in such cases where there is a small canal he does not use a drill. He recommends in preference to gold or amalgam oxychloride of zinc, gutta-percha, and plain cotton. The first named makes by far the best material for the purpose, if it were not for there being a chance of future trouble at the end of the root, no matter how careful we are in our treatment. He thinks no one can be positive of success, as it is just possible that a small amount of decayed tissue may be left in the canal, and a very small particle would cause trouble; therefore he would use gutta-percha or the cotton for about one year, or as long as a good cement filling would last, and at the end of that time, if there was no sign of trouble, and on removing the filling, he found no trace of putrescent matter is found, he might then fill with oxychloride with safety. To fill with gutta-percha dissolve some of the material in chloroform to about the consistency of cream, and then with a broach work a little into the canal, and then take one of those points made for the purpose, and insert in the canal as far as the apex. If care is taken not to get too much of the liquid gutta-percha in the canal, and it is not too thin, there is very little danger of forcing any through the foramen; and even if a small portion should go through, it would cause any trouble. He takes a shred of cotton and rolls tightly with the fingers; then dipping it in carbolic acid, carry it to the apex with a smooth broach and pack it firmly; this makes about as reliable a filling as any; and although there are failures reported, if the truth be known, not more than with the other materials.

Manipulative Miscellany.

All new instruments or articles wished to be described under this heading are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

A NEW AMALGAM CARRIER

MR. E. MOSELY, of Hastings, has sent us a new Amalgam Carrier which he has devised. It is made in the form of the

ordinary conveying forceps, to the end of which two half cylinders are attached ; these when brought together form a cylindrical tube similar to that of the combined tweezers and plugger now sold. When the forceps is closed, there is a spring catch, with which we are familiar in the artery forceps to keep the two halves of the tube in firm apposition. The amalgam is delivered by means of a solid rod fitted to the cylinder, longer than the tube in which it moves. This propeller is attached to a short lever which will be worked by the thumb.

The main advantage which this new Carrier promises, is that it will be so much easier to pick up the amalgam when it can be securely grasped and formed into compact cylinders. The tube is of smaller diameter than that of the instrument already referred to, and this also is an obvious advantage. The spring catch is so placed as to be worked by the thumb, but this is almost impossible, and we would suggest that it be placed on the opposite side, to be worked by the forefinger.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, December 2nd, 1889. Mr. HENRY SEWILL, M.R.C.S., L.D.S., *President*, in the chair. THE minutes of the preceding meeting having been read and confirmed,

Mr. John Charters Birch, L.D.S., Ire., of 2 Brunswick Place, Leeds, was balloted for and elected a non-resident member.

The Librarian (Mr. Ashley Gibbings) reported the addition to the Society's Library of Dr. George Johnson's "Essay on Asphyxia," the Transactions of the Royal Society and other journals.

Messrs. ROBBINS and C. D. DAVIS were elected Auditors.

Discussion on Mr. E. Lloyd Williams' Cases.

Mr. Storer Bennett said in connection with the first case, which Mr. Bland Sutton had very graphically described, he remembered a case which came to the Middlesex Hospital while he was a dresser to Mr. Henry Morris. It was that of a man at the other end of life, for while Mr. Sutton's patient was twenty-three the one of whom he spoke was over seventy

years of age. He had for three or four years suffered intense neuralgia on the right side of the face affecting the eye and cheek. For the treatment of this he had all the teeth of the upper jaw removed one after the other, with only temporary relief. It then became very evident that there was something deeper than a mere distal cause of the trouble. Mr. Henry Morris, after keeping the man under observation for a time, decided to stretch or remove the infra-orbital nerve, and dragging as much of the nerve out of its canal as he could. When the nerve was exposed a number of small tubercular-looking tumours could be seen on the nerve itself springing from the neurilemma, and these pressing down on the hard bony canal had caused intolerable pain. Of course in using the term tubercular he did not employ it in its pathological significance. After removing the nerve as far as it was possible to reach it no pain recurred. Unlike Mr. Sutton's case the tumour did not grow into the antrum, and in that respect there was a very great difference between them.

The President asked why Mr. Sutton had performed excision of the whole of the jaw rather than enucleation of the tumour.

Mr. Bland Sutton said in future, with the experience of this case before him, he should not hesitate to enucleate rather than remove the whole of the jaw. Referring to Mr. Lloyd Williams' case he said it was not until dissecting out the tumour afterwards that he became aware of its nature. It was the first case of the kind, and having had no previous experience he thought it safest to perform the operation as he had described it, and his surgical colleagues had taken the same view.

The President : With regard to the second case, viz., the mechanical treatment of perforation of the palate caused by syphilis, he had always made a point of not interfering with a syphilitic sore while active ulceration was going on, as he had more than once seen mischief follow premature use of an obturator in these cases.

Mr. F. Newland-Pedley said the experience at Guy's Hospital was not quite in accord with that of the President. They were in the habit at Guy's, as a matter of routine, of applying an obturator in all cases of perforation of the palate. The obturator was regarded by him as a splint, and it acted by preventing food, etc., from passing over the ulcerated surfaces, and so increasing the mischief. He should apply

an obturator whenever necrosis of bone with exfoliation occurred in the palate, whether as the result of syphilis, or traumatism, as from attempts at suicide. In response to a question from Mr. Hunt, Mr. Newland-Pedley said he believed that, provided there was actual perforation of the palate, it was best to adapt an obturator, even although ulceration of the soft parts were existent, but that when more bone was yet to come away he should hold his hand.

Mr. Hunt (Yeovil) was struck by Mr. Newland-Pedley's remarks ; they were at variance with all the teaching which he (Mr. Hunt) had had, and suggested a line of treatment which he thought must be opposed to the practice, not only of himself, but of others. Mr. Newland-Pedley enjoyed a wide experience at Guy's Hospital, and no doubt, had greater opportunities of observing than fell to the lot of many. Mr. Hunt hoped to hear the experience of others.

The President remarked that although he did not now see many cases of perforation of the palate, he had, while he was attached to a hospital, seen many, and his experience had led him to believe that the individual cases varied so much that it was impossible to generalise, but he had certainly followed the plan to which he had before referred, namely, he had waited for active ulceration to cease before applying an obturator.

Mr. Newland-Pedley felt that an important point to remember in the discussion was that not only did individual cases differ, but that the same was even more true of obturators those constructed to go into the perforation in the palate were most injurious, but he did not consider that one which simply acted as a splint and bridged over a cleft without unduly pressing upon the edges could possibly do harm, even when ulceration had not ceased.

Mr. Lloyd Williams, in replying, expressed his agreement with Mr. Newland-Pedley's views ; he regarded an obturator as a splint, and thought that by its early application, as in the case cited, the patient was benefitted, and the process of healing was assisted. In active ulceration, however, he should refrain from using an obturator.

Referring to Mr. Hepburn's paper on a New Slide Section Tray.

The President remarked that the subject of mechanical dentistry, although not often brought before the Society, was always of interest, and the very practical communication with

which Mr. Hepburn had favoured them was one of more importance.

Mr. Van der Pant (Kingston-on-Thames) complimented Mr. Hepburn upon the ingenuity of the "Slide Section Tray" which he had devised. He (Mr. Van der Pant) had been in the habit of treating the class of cases to which Mr. Hepburn has referred by cutting off the anterior part of the usual tray, and after oiling, or still better vaselining, the anterior surface of the teeth, applying some stent composition to obviate suction, and this plan he had found to answer very well. In the cases in which there was a long upper lip he thought Mr. Hepburn would find a difficulty and a great liability of failure.

Mr. Hunt considered Mr. Hepburn's suggestion a most useful one; for himself he had used plaster almost exclusively for more than twenty years, and those who had had practice with plaster could do all with it suggested by Mr. Hepburn, but without the special arrangement suggested by him. Mr. Hunt, while acknowledging the value of stent for taking *easy* models, considered it perfectly impossible to take an accurate model in stent where there were undercuts or long loose teeth, &c., and strongly counselled members who did not use plaster to try it. Practitioners accustomed to model for cleft palate must become skilled in the use of plaster, and with proper proportions of salt added its rate of setting could be regulated almost to seconds. He then proceeded to explain, by means of a rough diagram on the black board, a method of using plaster with ease in cases of very pronounced undercut, &c. A piece of well-softened stent, say the size of a pea, was carefully moulded into any undercut, or beneath any overhanging teeth, the operator's fingers being slightly smeared with vaseline, and these stent cores could be so moulded as to retain their positions whilst a tray properly filled with plaster was introduced. The tray on withdrawal would bring out these stent cores, or if any remained they could be lifted with fine forceps, and placed in true position in the female cast, into which plaster was then cast in the usual manner, and when the male cast was separated a perfect model with all the undercuts accurately rendered would be the result.

Mr. F. J. Bennett asked how the tray would answer in the case of a bar lower when the inner surface inclined inwards. He thought a model of the front surface of the teeth was not needed so much as the back.

Mr. D. Hepburn, replying, said the matter was so simple

and so easily understood in practice that he did not think much discussion was necessary. With reference to the point raised in cases of long lip, that was a little difficulty, but the stent hardens so completely that in withdrawing the tray the lip yields and the stent passes over it. With regard to Mr. Hunt's remarks, he was to be congratulated that he could combat all difficulties by confining himself to plaster as a material for taking models, but he (Mr. Hepburn) confessed he sometimes had cases in which he thought his tray would be of assistance.

Dr. George Cunningham showed a root trimmer invented by Dr. B. J. Bing, of Paris. The instrument is shaped something like a pair of separating forceps, one beak of which has a burr at the end capable of being lengthened or shortened by manipulation of a button attached to the handle and controlled by means of a spiral spring. By pressing this burr into the cavity of the root canal a good fulcrum is obtained for the rotatory manipulation of the knife blade, which is attached to the other limb of the forceps. The root can thus be trimmed without altering its natural contour unless it is especially desired to do so. It is not always necessary to trim the entire circumference of the root, and this instrument may be used to remove just the particular portion desired to bevel the edge of the root to any desired degree. Although it is not universally applicable he testified to the services rendered by this instrument in crown and bridge-work.

He also presented a duplicate case of removable bridge-work adjusted to the model which illustrated the constructive details of a class of denture which he had applied with success to several cases in actual practice, and which had not hitherto been described. The upper model showed only three teeth remaining, which are fairly sound—the second bicuspid and second molar on the right side and second bicuspid on the left—and the roots of all the anterior teeth which had been left without treatment under a partial upper denture of the ordinary kind for over fourteen years. All these roots were treated and filled to prevent further decay, but the bridge was only supported on the three strongest roots. The supporting roots were completely protected by gold ferrule caps with closed central tubes, which were fixed with thin phosphate cement. This arrangement avoided the necessity of any burr or other appliance which might interfere with the teeth being kept thoroughly clean. The bridge consisted of

a metal framework to which the teeth were attached by vulcanite, and is maintained in position by three parallel split pins fitting into tube roots, and a metal cap covering the intervening bicuspid on the left side. The patient is able to remove and replace the bridge with the greatest facility, so that thorough cleanliness is fully maintained, while the stability of the denture when in position is perfectly satisfactory. An endeavour to apply a similiar bridge by means of a combination of platinum Buttner's caps and all porcelain bridge-work had resulted in failure from the contraction of the porcelain, despite the use of a strong platinum frame.

He also presented specimens illustrating a new form of crown for incisors or canines invented by Dr. Sachs of Breslau. By this method almost the entire exposed surface of the root was protected by a cohesive gold filling, which also served to retain a corrugated closed platinum tube. This tube was further anchored by means of a small projecting flange, which fitted into a small fissure made on the side of the main canal. The dowel longitudinally corrugated to correspond with the fixed tube prevented rotation, without that sacrifice of the dentine necessary for the adjustment of a square or oval dowel of adequate strength. The crown consisted of an ordinary plate tooth backed with gold and soldered to the dowel, but without being contoured up to the usual shape of the crown, the object being to reduce the extent of contact with the root of a minimum amount. These crowns might be fixed either with mastic varnish, or thin oxychloride of zinc. This method of crowning, though somewhat difficult and troublesome to make, presents many advantages over other methods.

He also took this opportunity of shewing specimens of a method of crowning which he had already described before the Society in the course of discussion of other methods. It consists of a hollow gold ferrule either with or without a porcelain face adapted to it by means of an ordinary backed plate tooth soldered to the ferrule, and a How's screw as a dowel in the root, the ferrule and the dowel being cemented together by means of an amalgam packed through the opening in the crown. This method is peculiarly suited to bicuspid and molars, it is also applicable to certain cases of the anterior teeth, where the bite is not usually close. The advantages he claimed were : 1st, a possibility of certainty as to the accurate adaption of the ferrule to the neck of the tooth ; 2nd, the stability of the screw dowel ; 3rd, the use of a copper amal-

gam on the face of the root for its tooth-saving quality ; and 4th, the completion of the crown contour, and its exact adjustment to the articulation of the occluding teeth by a contour amalgam conspicuous for its edge strength. An experience of this method extending over several years enabled him to recommend it with complete confidence.

On behalf of Dr. Herbst of Bremen, he presented the following :—

Specimens 1 to 4 showed the use of gold rings in the restoration of crowns of bicuspid, practically the gold ring forming a permanent matrix for the retention of the amalgam with which the operation was completed. In one case, where the labial side was destroyed, an artificial tooth was fitted into the place and held in position by a gold ring and amalgam.

Specimen 5 demonstrated the application of the same operation to the crowns of molars which had been entirely lost, one case being treated with amalgam and the other with cement, and the grinding surface covered with a glass filling.

Specimen 6 showed the adaptation on the same principle of a glass filling to the crown of a bicuspid.

Specimen 7 shewed two large contour gold fillings made by the Herbst method, with the first part of the filling at the cervical margin made of tin and gold.

Specimen 7B consisted of two large contour gold fillings also filled by the Herbst method, but with this peculiarity that they were filled entirely with Wolrab's gold foil and not with cylinders—the surface was finished with extra heavy gold foil (No. 60).

Specimen 8 two gold fillings in central incisors filled from the lingual surface by the Herbst method.

In explanation of the method by which Dr. Herbst manipulated gold foil in such cavities he showed specimens of two instruments which Dr. Herbst largely used : first, a straight plugger formed by fixing an ordinary steel needle in a suitable handle and breaking off a small piece with a pair of pliers each time that a new serrated surface was required ; second, an inverted cone-like wheel instrument of bloodstone or agate.

In reference to the case of fracture of the superior maxillæ the President said he did not quite understand where Mr. Ackery traced the line of fracture.

Mr. Ackery : It commenced on the left side of the infra-orbital plate, passed transversely across the bridge of the nose,

and ended on the opposite side, about half an inch above the alveolar border.

The President remarked the case was a very interesting one, and there were many Members present steeped to the fingers in knowledge of diseases of the jaws, whom they would be glad to hear upon the subject.

Mr. Wm. Hern said the fracture seemed to involve both antrums; he should like to ask if there were any mischief on either side. There were two points of interest, first the proved disadvantage of any splint having a bar on the outside of the mouth. Mr. Hern had a case at the Dental Hospital of London a few years ago, in which he at first used a Kingsley splint, but it was a constant annoyance to the patient, the arms getting in the way when the head rested on the pillow, and tended rather to delay than assist recovery. The other point was the advisability of adopting a cap, instead of bandages, to maintain the splint in position.

Mr. Ackery, in reply, said no antral mischief existed. The cap was Mr. Paterson's idea. He might mention that the Kingsley splint was only on for three days, and in conjunction with Mr. Paterson he agreed that an internal splint should be used. Possibly Mr. Paterson's difficulty in putting in the splint about a week afterwards was due to the exudations having somewhat thickened.

STUDENTS SOCIETY OF THE LONDON DENTAL HOSPITAL.

ANNUAL GENERAL MEETING, held Monday, January, 20th, 1890, at 8 p.m. William Hern, Esq., President in the chair.

THE minutes of the previous meeting were read and confirmed.

Mr. A. T. Burt signed the Obligation Book and was formally admitted to membership by the President.

The Librarian announced that Mr. Hern had kindly presented the Society with two volumes of the "American System of Dental Surgery." This was not the first time during the past year that the Society had benefitted by Mr. Hern's generosity.

Messrs. Gask and Seymour having been chosen as scrutators, the balloting for next year's officers was then proceeded with.

The Secretary then read the Council's Report for the past year. This was as follows :—

COUNCIL'S REPORT.

GENTLEMEN,

In presenting you with the twenty-seventh yearly report your President and Council are happy to be able to note, a year of continued progress and prosperity.

The papers read have maintained the high excellence of former years. That their practical nature has been thoroughly appreciated is shown by the lengthy discussions which have ensued, and by the average attendance having risen to 37.

Feeling the usefulness of this and similar societies, your Council are glad to welcome the suggested foundation of one in connection with the Liverpool Dental School. In response to a request, copies of your rules and transactions have been forwarded to that school.

The most important administrative advance of the year, is the printing in your transactions of any diagrams shown at the Society's meetings, which have been previously approved by the council. It has been felt wise to limit the amount of money spent by the society on this, but it is open to any member to have further diagrams printed at his own cost, the sum usually being small.

Several gifts of valuable books have been made to your library and missing numbers of journals of previous years have been procured. These volumes are now in the hands of the binders, and will, no doubt, be of value as works of reference. It has been thought necessary to enforce a deposit system when borrowing books, this is consequent on several serious losses having occurred. The Council asks the assistance of the Society in avoiding these for the future.

You are indebted to Messrs. Woodhouse and Matheson for having kindly acted as examiners of the papers for 1888. They awarded the prize to Mr. Harsant for his paper on "Fractures of the Maxillæ."

Some important alterations have been made in the rules.

The names suggested by the council as officers for year ensuing will in future be announced at the December meeting, and members will be asked then to propose any additional names they may wish, so that they may also be printed on the balloting lists. The hour at which the society will meet has been altered from 7 p.m. to 8 p.m. These alterations

have not been made without full discussion by your council, but they would special'y ask members to freely state their views on these points.

Much time was spent by your Council over a scheme for developing your transactions into a journal, but after full deliberation it was decided that this was at present beyond the means of the Society, the idea was therefore abandoned. A record of estimates, etc. has been made in the Council's minutes, which may prove of use should the question ever again be raised. Your Council wish to acknowledge the great courtesy shown them by Messrs. Segg & Co. in connection with this matter.

The growth of the Society continues uninterruptedly, the number of members who have joined during the year is thirty-five. The Council are also glad to notice the number of past students who from time to time attend the meetings, they are sure the Society most heartily welcomes them.

In resigning the trust you committed to their care a year ago, your Council thanks you for the help you have rendered them in endeavouring to prove themselves worthy of that trust. Gentlemen, they would ask each and every member to look upon this Society as his own Society to watch over its growth and forward its interests. For the power in debate which each may here attain, the knowledge which he may gain, and the reputation he may make in our somewhat narrow circle will not be lost when he leaves this for a wider sphere of work, but will be carried forward with interest.

The Treasurer then read his report, which will appear in our next issue.

On casual communications being called,

Mr. Boyton presented models of an upper jaw showing a supernumerary tooth behind the canine. Also models of a case showing a fracture of the lower jaw and its treatment by means of a Hammond's splint. The accident occurred three months before Mr. Boyton saw the case, and had been treated by a four-tailed bandage and external splint. No union had taken place and an abscess opened at the front of the neck, a second under the symphysis and through the sinuses some spiculæ of bone were lost. There was some trouble in fixing the splint and so Mr. Boyton, adopted the novel method of soldering gold clasps to the splint, as supplementary holds to the usual ligatures. The case did remarkably well, a cure resulting.

The President spoke to the comfort of these splints, mentioning patients who continued to wear them for months.

Mr. Woolf presented a second upper molar, which actually tumbled out when attempts were being made to remove an impacted wisdom from behind it. The postero-external fang was absorbed on its posterior aspect, the nerve canal was almost exposed, but the surface left was smooth, possibly from friction.

Mr. G. Hern read notes of a case of a girl aged 25, who was under Mr. Hulke at Middlesex Hospital.

The whole face was swollen, but in the left submaxillary region was an exceeding tender hard, semicircumscribed mass, about the size of a hen's egg. She could scarcely open her mouth and the breath was exceedingly offensive. A fracture of the lower jaw was found on *both* sides in the region of the bicuspid teeth. This was due to a blow on the left side, which had knocked out the second bicuspid and had broken the crown of the first molar from its roots. At first she was treated as an out-patient (since she refused admission) with an external splint and mouth wash, but the face swelling so much she was taken in. The swelling was opened and a quantity of pus evacuated. The patient then did well.

Mr. Mountford narrated a case they had had at the Charing Cross Hospital of a fractured jaw from a lift accident; this was followed by suppuration about the fracture and consequent ulceration opened up an artery. Several swellings formed and on opening one it was found to be an aneurysm. This necessitated ligation of the Common Carotid artery.

Mr. Gardiner presented two models shewing the elevation of the cingulum of bicuspids into additional cusps. And also a model showing an irregular supplemental tooth between the left upper incisors—there was also hare-lip.

Mr. Robinson narrated a case of a patient who came for pain in the region of a 2nd upper bicuspid,—this tooth being removed an opening was found into the antrum, this was washed out with Condyl's fluid. At a subsequent visit the discharge was still as great and a piece of the root of the canine was found free in the antrum. This tooth had been extracted before the patient's first visit. On removing this piece, the discharge soon stopped and the wound healed.

The scrutators having retired to count the ballot, the President then called upon Mr. E. Preedy for his Paper on "The Implantation—Replantation—and Transplantation of Teeth." (See page 97.)

The President opened the discussion by mentioning some cases he had met with.

The first was that of a boy, aged 15, who had two truncated supplemental teeth in the place of the normal centrals, these being displaced high up on the gum. The right supplemental tooth was extracted and the central placed in its socket, the case did exceedingly well, and it was intended to proceed with the opposite side, but the case was lost sight of owing to the family emigrating.

The second was one of transplanting a right lateral erupted far back in the palate, into the socket of the left tooth. It was too long, but became tight in the new position, and was subsequently shortened. Most of the cases fail from absorption of the roots, and he preferred never to drill out a nerve through the apex, which would only enlarge the foramen, and open absorption, but to drill through the crown. He thought the system of capping the apex with gold was faulty.

Mr. J. P. Smith had had one case of transplantation while at the Hospital. The patient was a boy who had lost the crown of the left central. Finding that the canine was crowded out of line, Mr. Smith determined to extract it, and implant it in place of the central. He accordingly extracted the remains of the central root and the canine. Finding the root of the latter too long, he cast off the tip, and then placed the tooth in the central socket. The cusp was ground down to make the tooth resemble a central. At first a small vulcanite splint was worn, and afterwards a Hammond splint, but as the tooth remained loose after several weeks, it was removed.

Mr. Schelling said he had extracted a temporary tooth for a child, aged 12 years, which had been knocked out and replaced by the mother four years previously. The foramen was enlarged, and its edges rough—possibly this was the cause of the pain the child felt when biting on it. He also mentioned a case where a bicuspid had been extracted, filled, and replaced.

Mr. Coysh mentioned a case he had met while a pupil. The first upper bicuspid was carious. The second bicuspid being emptied very much out of late, it was thought advisable to extract both, and put the second in place of the first bicuspid. On extraction, however, the root of the second tooth was found to be so big that the attempt was abandoned, and the tooth replaced in its own socket. It became quite firm, and afterwards brought into line by regulating.

Mr. Porter asked as to the desirability of removing the pulp before replanting.

Mr. G. Hern asked Mr. Smith if the tooth he extracted had any bony deposit on the root, or was destitute of periosteum. Mr. Smith said the root was partly absorbed, and no deposit of bone was present.

Mr. C. Robbins thought the whole subject was in an experimental stage, and certainly not one to be freely imported into private practice. He had heard of two successful cases which were brought forward with suspicious regularity at each Annual General Meeting of the British Dental Association. At one of these meetings he saw the operation performed, and could not say it bore out the statement as regards its painlessness. It seemed a most ghastly sight, and the patient, a young healthy man, seemed anything but happy afterwards.

Mr. Mountford had recently seen a patient who gave the following history. Two years before he had applied to an American dentist, who had advised him to have a space in the dental arch, caused by extraction a year previously, filled by implantation. Accordingly an artificial socket was made, and a tooth implanted. It was a complete success, and in the patient's own words, the new tooth was the best in his head. He described the operation as anything but painless.

Mr. Seymour certainly would look with suspicion on the history of any tooth, and would not care about any being placed in his mouth. In cases of Replantation and Transplantation he certainly should fill the root first.

Mr. Preedy then replied to the various speakers.

The President then announced the result of the ballot which was as follows :—

President.—Mr. Leonard Matheson, L.D.S.

Vice-Presidents.—Mr. J. F. Colyer, M.R.C.S., L.D.S.
Mr. F. C. Porter, L.D.S.

Treasurer.—Mr. E. Preedy.

Honorary Secretaries.—Mr. F. A. Harsant, L.D.S.,
Mr. Geo. Hern.

Councillors, Senior.—Messrs. W. R. Barrett, E. Bull,
W. S. Holford, F. May, C. Schelling.

Junior.—Messrs. T. Coysh, H. Goddard, E. J. Hall, J. Humphreys.

The President then moved a vote of thanks to the Publishers of the *British Journal of Dental Science*, *Dental Record*,

and *Journal of the British Dental Association* for kindly supplying the Society with copies of their valuable Journals. This was carried with acclamation. The President then gave his valedictory address.

Mr. W. May moved that the thanks of the society be given to the President and retiring officers for the excellent service they had rendered the Society during the past year. This was the signal for an outburst of great enthusiasm, the repeated cheering showing the appreciation the members had of the manner in which Mr. Hern had led the Society during the last two years, and of his untiring zeal and unflagging energy for the welfare of its members.

Mr. Hern briefly acknowledged the vote of thanks.

The President then announced that the next meeting would take place on Feb. 10th, when Mr. E. Bull would read a paper on "Impressions and Impression taking."

The President then vacated the chair and the proceedings terminated.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of this Society took place at the Victoria Dental Hospital of Manchester, on Dec. 10th, the President, Mr. Headridge, in the chair.

NEW MEMBERS.

Mr. Percy Linnell, L.D.S., Eng., King Street, Manchester, was elected a member of the Society.

CASUAL COMMUNICATIONS.

Mr. W. A. Hooton showed a collection of bones and specimens of ancient implements and pottery recently discovered in a limestone cavern at Deepdale, near Buxton, including remains of a brown bear, Celtic ox deer, wild boar, and also of fox, sheep, horse, and other animals.

The skull of the bear, which was in fine preservation, was found imbedded in a mass of stalagmite more than a foot thick. The specimen was an old one, and the teeth had been subjected to very rough usage, being excessively worn down and many of the pulp cavities exposed. The canines had all been fractured and afterwards worn smooth with the exception of the right upper, which was of full length and encircled by a band of erosion. There was no trace of the second premolars.

The skull of a Celtic ox (*bos longifrons*) showed portions

of skin in a petrified condition still adherent, and there was also half the lower jaw of a calf.

In the clay were found portions of a stag's antlers of great size, somewhat softened by exposure to moisture.

Although no human bones have so far been met with, the signs of man's presence were conclusive, and that probably during the ancient British and Roman periods. One antler had been divided, and the tip smoothed and sharply-pointed; another was shaped, apparently for use as a spear head, and close at hand a small carved bone ornament, much blackened and some bits of bronze were found.

We know that fires were made in the cave for fragments of charcoal are preserved in the stalagmite.

The specimens of pottery are unfortunately much broken up, but examples of Romano-British and also of Samia ware have been identified by Prof. Boyd-Dawkins, also pieces of hand-made pottery.

A systematic exploration of this cave—or rather series of caves, for there are several communicating with one another, has still to be undertaken, but enough has been done to justify the hope that still more important results will be brought to light.

Dr. Shaw said that what had been exhibited by Mr. Hooton referred as far back to that almost eternity of the past when the limestone was formed in which the caves are now found—a time before the appearance of vertebrate animals. And even when, inconceivable ages after, it was formed the limestone had risen from the shallow seas and became a part of the dry land, these caves must have been formed in it at a date so remote as to be almost incomprehensible to our mental grasp. And they had undoubtedly been from a time of which we have no record down to clearly historical times, the homes of animals—man included. Many of these animals have, in only comparatively recent times, become extinct. In many of these caves, however, are to be found remains that show they have been the homes of animals now only to be found in hot climates, but were able to roam far north of their present habitations, at that period when this island formed part of a great continent which was connected with Africa and possessed an altogether different temperature than at present. The ruder kind of pottery to which Mr. Hooton referred are probably of Neolithic origin. In regard to the ornaments and better class of pottery found in these caves, it shows they have been at some time inhabited by a race greatly

superior to the ancient riverdrift and cave-men, and their still later Neolithic inhabitants ; and there can be no doubt they were the places in which the Celtic and Roman element sought refuge at the time of the first Saxon invasion. These latter evidences of occupation would naturally be found near the debris, and he would like to ask Mr. Hooton how much farther down he was obliged to dig to find the skulls of the animals which he had shown, or were they in such a position as to show they occupied the cave after the Roman colonist. Referring to the inferior jaw of a wild boar in which there was, at the extreme posterior portion, a fully formed molar tooth which had not yet erupted, and consequently, had not any of its cusps in the slightest degree worn down by mastication, he (Dr. Shaw) said that he had read a paper some years since before the Manchester Microscopical Society in which he had vaguely hinted at a theory which he had not since had time to work out, but which he would now clearly and distinctly state and leave it to younger men to consider. Mr. Hooton had also exhibited a most interesting specimen of a young partly-formed and unerupted horse tooth in which also there had not been any wearing down of the cusps. He (Dr. Shaw) had several specimens of the same sort now, this horse tooth was in reality a combination of five teeth with projecting cones of various heights. As soon as the tooth appeared in the mouth these cones began to be worn down in mastication and the tooth presented a flat surface with alternate layers of enamel, dentine and cementum so arranged that the occlusion formed a veritable mill for grinding the food. Although the molars of the bear—the bear's are not made up in the same way as are those of the horse, the wearing down can be seen to have taken place in the teeth of the bear and the boar exhibited ; and if gentlemen will kindly examine this unerupted tooth at the extreme posterior portion of the inferior jaw of the boar, it will be seen what this animal's molars are like when first formed, and before they are put to any use. They are unmistakably made up of a great number of cones. Therefore, it was his (Dr. Shaw's) opinion, that, while in the primitive manner, dentine, and eventually teeth, first appeared, there were no signs of cones when this form did, in the long process of time, make its appearance, it became a starting point from which has been derived, by a great variety of combinations the forms of the teeth of the higher animals.

Mr. Dreschfeld asked what Dr. Shaw wanted to prove :

when that gentleman regretted his inability, in so short a space of time, to make clear the views he held upon a matter so important, and went partially over the subject again.

Mr. Hooton, in replying to Dr. Shaw's inquiry, said that he was unable to give much information about the relative position in which the specimens were found. As he had already mentioned, the skull of the bear was found imbedded in a mass of stalagmite. Many other of the specimens were found at some depth below the surface in the clay. Therefore there was a great element of doubt as to the relative positions of the specimens found. Moreover, they did not know whether those bones were deposited by animals dying there, by having been carried in by other animals as prey, or deposited by floods. In regard to cones being the fundamental shape of teeth, he thought it held thoroughly for mammalia, but not for lower orders—say of fishes.

Mr. Champion moved in a highly complimentary speech, and Dr. Shaw seconded, a hearty vote of thanks to Mr. Hooton, which was passed.

Mr. Champion also proposed, and Mr. Whittaker seconded a vote of thanks to the Dental Manufacturing Co. for the loan of the electric light and other apparatus provided for the demonstrations, which was also passed.

DEMONSTRATIONS.

Mr. Planck demonstrated the use of the Perry Separator and showed his method of adjusting the rubber dam by filling a superior incisor.

Mr. George G. Champion demonstrated a method of combining amalgam and gold in one filling at the same sitting. He filled a crown cavity, lining it first with copper amalgam over which he packed the gold. Beginning with Ash's No 4 non-cohesive foil rolled up into rope form and cut into short lengths he packed round the walls of the cavity against the amalgam keeping the gold well over the edges and finally finished up in the centre with cohesive foil.

Mr. Whittaker made a filling in a superior central tooth in order to demonstrate the use of the rubber dam when only about two inches square. In making his filling, Mr. Whittaker commenced with gold cylinders placed in parallel layers at the cervical edge until the cavity was two-thirds full, and then finished off with cohesive gold, using hand pressure and automatic mallet combined.

After the demonstrations, the secretary, Mr. Skipp, announced that it had been proposed to hold the usual discus-

sion at the February meeting, and to devote that meeting, with this exception, to casual communications.

Mr. Dreschfeld said he did not think it would be right to criticise the work of the gentlemen who had so kindly given them the demonstration.

Mr. G. G. Campion said that as one of the demonstrators he should be very glad of some criticisms.

The President then announced that it had been arranged with a gentleman to give them an exhibition of continuous gum work at the February meeting.

The proceedings then terminated.

STUDENTS' SOCIETY OF THE NATIONAL DENTAL HOSPITAL.

The last ordinary meeting of the year of this Society was held on Friday, Dec. 6th, at 8.0 p.m.

The minutes of the previous meeting were read by the Secretary and confirmed.

Messrs. Buist and Shilling were present as visitors and received the usual form of welcome from the President.

The following gentlemen brought forward Casual Communications for the Society's inspection : Messrs. Carter, Humby, Denison Pedley and Ridson.

The names of officers for the ensuing year were nominated for election.

The President then called upon Mr. R. Denison Pedley for his paper entitled "Some of the Causes of Decay in Children's Teeth and their Treatment."

He stated that the principal predisposing causes of disease were unhealthy parents, unwholesome food and miserable homes. This was true of the teeth as the body in general. Inheritance had an important influence on the teeth in many ways ; but its direct influence was frequently obvious in the defective structure of the temporary teeth, as their crowns were for the most part calcified before birth.

Defective structure of the teeth was due chiefly to such constitutional diseases as syphilis, rickets and the eruptive fevers.

Dental Surgeons were only called upon to treat the local manifestations of such predisposing and constitutional causes, with the exception of *improper feeding*. Rickets was a diet disease. Every one having the care of children's teeth

should take an interest in the important subject of diet. It was not so much diet tables we wanted, but the use of common sense, as much of the improper feeding of children was due to ignorance. Uncleanliness is one of the principal causes of decay in the teeth of young children. Among the poor, a tooth-brush is seldom known; even among the intelligent and well-to-do its use is not commenced early enough. Children's teeth should be cleansed as soon as they have any. Very little care is taken of temporary teeth, they should be retained as long as possible. Careful cleansing and filling as a substitute for decay were the principal treatment; where caries was superficial the application of nitrate of silver is useful. There should be no hesitation about extracting a temporary tooth when a child cannot eat on it with comfort and is in constant pain, or there is any sign of an alveolar abscess arising from it. There is no evidence to support the idea that the jaw contracts; when temporary teeth are retained too long disastrous results often arise from suppuration spreading to their permanent successors; absorption of the fangs is a vital process, the absorbing papilla will only attack living tissue; dead roots destroy the absorbing organ, therefore its function ceases.

Evidence of these facts shown:—1. By the ends of necrosed roots protruding through the gum and even piercing the cheek. 2. Carious dentine in the crowns is left standing alone while the living tissue is eaten out all around it.

A discussion followed in which Messrs. Allnutt, Carter, Grutham, Humby, Prager, the Dean and the President took part, after which the President thanked Mr. Pedley for his paper, and the meeting was adjourned until the second Friday in January.

Review.

A Practical Treatise on Artificial Crown and Bridge Work.

By George Evans. Second Edition, revised and enlarged.

[S.S. White, Dental Mfg. Co.]

The terms "crowning" and "bridging" have been so dinned into our ears of late, that most of us must almost resent having our attention drawn to these operations once more. But, although a great deal of "bunkum" has been talked and written on the subject, it is not an unimportant one, and a word of welcome is due to a book which pre-

sents a fair resumé of the many existing methods of utilising roots and broken down teeth as foundations for artificial crowns and dentures. Students of current dental literature will recognise this book as being, for the most part, a careful compendium of articles which have appeared from time to time in various journals; possessors of the American System of Dental Surgery will find its chapters on crown and bridge work here repeated, with some useful additions; whilst readers who have not yet made themselves acquainted with the literature of the subject will find most of what they need in Dr. Evans' work. The book is not exhaustive, but though there are omissions which prevent it from being a complete monograph, it contains enough, and more than enough, to make it well worth reading—and buying.

There is an introduction to the volume which the adjective 'highfalutin' would not improperly describe, but it contains sensible sentiments, such as that 'the interests of the patient should be paramount to every other consideration.' That is a good introductory note to strike.

In Part I. we have directions, clear and explicit, as to the treatment necessary for teeth and roots, preparatory to receiving crowns. There is a sensible protest against unnecessary devitalization of pulps, it being reasonably urged, that whilst a pulpless tooth no doubt retains its living connection with surrounding parts by reason of the vitality of the cementum—yet that the latter is not sufficient to make the tooth's term of usefulness as certain or as prolonged as where the pulp is retained in a healthy condition. Capping of a perfectly healthy pulp, in a healthy subject, is therefore recommended, wisely as we think; though the kind of capping described is not, according to our experience, the best—a concave vulcanite cap attached by means of oxy-sulphate of zinc (Fletcher's Artificial Dentine) being, we hold, a safer thing when the pulp is almost or quite exposed, than the use of semi-fluid oxy-phosphate. Quite admirable are the chapters which briefly but distinctly give instruction concerning the preparation of canals after devitalization of diseased pulps, or when the root under treatment is connected with an alveolar abscess. The paramount necessity of caution, delicacy and thoroughness in this kind of work is forcibly inculcated. The use of the silver probe figured on page 32, as a means of drying canals, is a useful wrinkle. There is a good chapter on the important subject of shaping teeth and roots for the reception of crowns, though it would be more complete if

there were mentioned, as of great use in trimming root margins, a strong slightly curved scraper.

Part II., consisting of about 100 pages, contains good descriptions of some thirty methods of crowning, most of which are slight modifications of several distinct types. These types may with advantage be briefly classified, (though this is not done very clearly in the book), in order to point out their comparative importance :—

1. All-porcelain crowns, without cap or collar, pin not baked in. To this class belong the Bonwill and How methods, and all of that ilk.

2. All-porcelain crowns, without cap or collar, pin baked in. The Logan and Brown crowns are types of this kind.

3. Porcelain crowns backed with gold, and mounted on cap and pin fitting tightly into canal made the exact size of pin.

4. Collared Crowns,—all gold and porcelain and gold ; under which heading come the Richmond and Knapp crowns.

The last-named class of work undoubtedly stands first in importance. For use and permanance in mastication nothing can approach the all gold crowns ; whilst for front teeth, the porcelain crown—backed and contoured, or tube (which latter, by the way, is not once mentioned by Dr. Evans), and with a soldered pin and collar attachment, stands pre-eminent as the most beautiful and durable kind of pivot that can be made. Next in importance comes Class 3, which our author gives but a cursory glance at, making his work here very incomplete by omitting all reference either to Mr. Balkwill's well-known method, or to the old-fashioned, but still most valuable tube and pin pivot. Classes 1 and 2 we have not much opinion of, except in cases where time is very limited, where roots are much decayed, and where the patient is given clearly to understand that permanence is not to be relied on. Careful and minute directions in the construction and adaptation of collared crowns are given in chaps. 6, 7, 8, of Part II., and these are worthy of the most careful study, along with chap. II of Part III., which should be read at the same time. The last named chapter contains a too short account of Dr. Knapp's processes. They deserve more space than is given to them, and they are fully worthy of a more hearty recommendation than that accorded on p. 231.

In Part III., we find bridge-work described in detail. The author certainly has the courage of his opinions, for in his

remarks introductory to this section, he very fully states the objections which are brought forward against bridge-work. Some of these objections, (p. 149), have, without doubt, much weight,—so much so, indeed, as in our opinion to outweigh compensating advantages claimed, except in a limited number of cases. In such cases, too, we hold that, as a rule, every bridge that is at all extensive should be made moveable.

Where the number of teeth carried by the bridge is small, one may sometimes with safety make the appliance a fixture; but there is no reason or excuse for doing so in an extensive bridge, in view of the various ways in which it can be made removeable, thanks to the methods introduced by Dr. Parr, Gartrell, and others.

To construct a large and elaborate denture, to use infinite pains and a great deal of time in adapting it accurately to the mouth, and then to attach it as a fixture, is, to our minds, nothing less than fraudulent folly, which in ninety-nine cases out of a hundred, the patient, and the dentist too, if he is an honest man, will live bitterly to regret. To use milder language would be to ignore the cases that are perpetually presenting themselves in which, in spite of carefully and finely finished workmanship, bridges, after a brief period of comfort and usefulness (not always even that), come pitifully to grief, and have to be removed—generally in company with one or more of the teeth to which the appliance has been attached.

In the very work before us there are repeated references to the difficulties attending the repair of fixed bridges, and we find on page 188, such an elaborate description of the care necessary to the healthy and comfortable maintenance of such “fixtures” as would quite baffle the patience and perseverance of ordinary mortals.

Feeling so strongly as we do on the question of fixed bridges, we cannot but look upon most of the directions and cases given in Chaps. 1—7, 11 and 15, of this part, as examples of misplaced ingenuity. Such small dentures as are given in figs 312, 315, and 338 may sometimes be, with reason, fixed irremoveably, but the larger ones we cannot but deprecate. Chapters 8 and 9 may be studied with advantage^t they deal in detail with the construction of removeable bridges: Dr. Parr’s modes of work are worthy of very careful consideration. Of Mr. Gartrell’s ingenious method there is no mention. It would run hard any system described in Dr. Evans’ book.

Taking the book as a whole, the arrangement of matter might be better (especially in Part II), but on the whole it 'goes' well. There is no pretension to style or literary merit. The illustrations are profuse in number, and nearly all of them good in quality. In Part IV. some useful tables and recipes are given. The volume is well printed, has a good index, and is convenient in form.

The tyro will find little or no assistance in deciding on the best method to adopt under varying circumstances, nor will he find any vigorous assertion of the superiority of one method over another. The book is, in fact, too impartial. It appears almost as if the author must have suppressed any personal preference, in his desire to give all methods a fair representation. This, no doubt, is praiseworthy as an exhibition of self-control, but it is much to be regretted from a practical point of view, especially by the beginner, who may look almost in vain for any guidance as to a choice of method.

Once the choice is made, however, and there will be found full and explicit directions as to the ways and means and manner of construction to be adopted in order to secure such success as the method chosen permits of.

Dental News.

THE TENTH INTERNATIONAL MEDICAL CONGRESS, Berlin, 1890.

REGULATIONS AND PROGRAMME.

I. The Tenth International Medical Congress will be opened in Berlin on Monday, August 4th, 1890, and will be closed on Saturday, August 9th.

II. The Congress shall consist of legally qualified medical men who have inscribed themselves as Members, and have paid for their Card of Membership. Other men of science who interest themselves in the work of the Congress, may be admitted as Extraordinary Members.

Those who take part in the Congress shall pay a subscription of 20 Marks (one Pound stg. or 5 dols.) on being enrolled as Members. For this sum they shall receive a copy of the Transactions, as soon as they appear. The enrolment shall take place at the beginning of the Congress. Gentle-

men may, however, be enrolled as members by sending the amount of the subscription to the Treasurer*) with their name, professional status and residence appended.

III. The object of the Congress is an exclusively scientific one.

IV. The work of the Congress will be discharged by eighteen different Sections. The members shall declare upon enrolment to which Section or Sections they intend to attach themselves.

V. The Committee of Organisation shall, at the opening sitting of the Congress, suggest the Election of a definite Committee (or Bureau) which shall consist of a President, three Vice-Presidents, and of a number—as yet undermined of Honorary Presidents and Secretaries.

At the first meeting of each Section a President and certain number of Hon. Presidents shall be elected; these latter shall conduct the business of the sections in turn with the Presidents.

On account of the different languages employed, a suitable number of Secretaries shall be chosen from among the foreign Members. The duties of the foreign Secretaries shall be confined to the sittings of the Congress.

After the termination of the Congress the editing of the Transactions shall be carried out by a Committee specially appointed for this purpose.

VI. The Congress will assemble daily, either for a General Meeting or for the labours of the different sections.

The General Meetings will be held between 11 and 2 o'clock. Three such meetings will take place.

The time for the sittings of the various sections will be fixed by the special committee of each section, it being understood, however, that no such sittings are to take place during the hours allotted to the General Meetings.

Joint sittings of two or more sections may be held, provided that the Bureau of the Congress can offer suitable rooms for such sittings.

VII. The general meetings shall be devoted to

(a) Transactions connected with the work and general management of the Congress.

(b) Speeches and communications of general interest.

VIII. Addresses in the general sittings, as well as in any

* Treasurer's Address: Dr. M. Bartels, Berlin, SW., Leipzigerstrasse 75. Please to enclose a visiting-card.

extraordinary meetings which may be determined upon can only be given by those who have been specially requested by the Committee of Organisation.

Proposals relative to the future management of the Congress must be announced to the Committee of Organisation before July 1st., 1890. The Committee shall decide whether these proposals are suitable to be introduced for discussion.

IX. In the sittings of the sections, questions and problems will be discussed, which have been agreed upon by the special Committee of Organisation. The communications by those appointed by the committee to report on a subject, shall form the basis of discussion. As far as time allows, other communications or proposals, proceeding from members and sanctioned by the Committee of Organisation may be introduced for discussion. The Bureau of each section decides as to the acceptance of such offered communications, and as to the order in which they shall come before the meeting, always provided that this point has not been already determined in the sitting itself by the decree of the section.

Scientific questions shall not be put to the vote.

X. Introductory addresses in the Sections must as a rule not exceed twenty minutes in length. In the discussions no more than ten minutes are allowed to each speaker.

XI. All addresses and papers in the general and sectional meetings must be handed over to the Secretaries, in writing, before the end of the sitting. The Editorial-Committee shall decide whether—and to what extent—these written contributions shall be included in the printed Transactions of the Congress. The members who have taken part in the discussions, will be requested to hand over to the Secretaries, before the end of the day, in writing, the substance of their remarks.

XII. The official languages of all the sittings shall be German, English, and French. The Regulations, the Programme, and the Agenda for the day will be printed in all three languages.

It will, however, be allowable to make use of other languages than the above for brief remarks, always provided that one of the members present is ready to translate the gist of such remarks into one of the official languages.

XIII. The acting president shall conduct the business of each meeting according to the parliamentary rules generally accepted in deliberate assemblies.

XIV. Medical Students, and other persons, ladies and

gentlemen, who are not Physicians, but who take a special interest in the work of a particular sitting, may be invited by the President or be allowed to attend the sitting by special permission.

XV. Communications or enquiries regarding the sections, must be addressed to the managing members thereof. All other communications and enquiries must be directed to the General Secretary, Dr. LASSAR, Berlin, N.W., 19, Karlstrasse.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

TEACHING OF MECHANICAL DENTISTRY.

To the Editor of the British Journal of Dental Science.

DEAR SIR.—Your timely leader under the above heading, will be read with interest by every practitioner who has the welfare of his profession at heart. Nowadays the tendency is to scamp the rudimentary training of the workroom, and to rush through that part of their education in the easiest possible manner. It is only in after life the mistake is detected, when one must depend, either upon oneself, or on the skill of a mechanical assistant, who never in æsthetic dentistry can take the place of the principal. Indeed the qualified student, too often finds his unqualified neighbour successfully competing against him, in the most lucrative branch of his practice, therefore it behoves our Hospital authorities to look well to the mechanical training of their students, and to enforce by precept, and the establishment of dental laboratories, the art of prosthetic dentistry.

The Edinburgh authorities, I believe, lay claim to be the pioneers in the opening of dental laboratories, their new Hospital "affording special facilities in the mechanical department under the superintendence of the Lecturer in Dental Mechanics and his demonstrators; a large and fully-equipped workroom under the charge and direction of a competent mechanic having been set aside for the construction of dental appliances."

I quote from an opening announcement, and naturally it was expected that in a few weeks the students would be at work in the laboratory. Week by week passed, and no initial movement was made, the benches and seats were there, and the appliances were dwindling in, in a listless manner that augured ill for the successful conduct of the establishment. Months passed with no better result, what tools appeared were lying idly and in confusion on the bench. Sometime about October last the competent mechanic appeared, but unfortunately his stay was short and need not be commented upon, the little work done being the superintendence of apparatus getting fixed, with an occasional

relaxation in the shape of a verbal bout with some student. It was then hoped the beginning of a new session would see the Lecturer bestirring himself in the laudable object of keeping faith with his students, or at least seeing that his demonstrator did something toward that object, literally nothing however has been done: the workroom remains unoccupied students prepare for their exams. untrammelled by dental mechanics; and toothless paupers weary of long promised substitutes fall an easy prey to the mercenary charlatan.

It is with feelings of deep regret that I deprecate the mechanical instruction in our Edinburgh Dental School, but the position I take up cannot but be upheld by every present student of that institution. A year has nearly passed, with little sign of advancement, and if the school hopes to maintain the position she pretends to in the instruction of dental mechanics, I would hint that it cannot be done on verbosity alone.

I am sir,

Yours most truly,

A PAST STUDENT.

Jan. 24th, 1890.

Hospital Reports.

MONTHLY STATEMENT of operations performed at the Dental Hospital of London, during December, 1889:—

Extractions	Children under 14	.	.	.	.	.	315
	Adults	.	.	.	.	.	915
	Under Nitrous Oxide	.	.	.	.	.	1035
Gold Fillings.	.	.	.	.	.	.	293
Plastic Fillings	.	.	.	.	.	.	1039
Advice and Irregularities	.	.	.	.	.	.	75
Miscellaneous	.	.	.	.	.	.	402
Total							4074

F. C. PORTER,

T. A. GOARD,

V. KNOWLES,

} *House Surgeons.*

Report of cases treated at the Royal Portsmouth, Portsea and Gosport Hospital from January 1st to December 31st, 1889.

Teeth extracted	.	.	.	.	.	.	987
Under Chloroform.	.	.	.	.	.	.	10
Advice, Sealing, etc.	.	.	.	.	.	.	319
Irregularities of the Teeth	.	.	.	.	.	.	211
Total							1527

W. H. KIRTON, L.D.S., Ire. *Hon. Dental Surgeon.*

British Journal of Dental Science.

No. 529. LONDON, FEB. 15, 1890. VOL. XXXIII.

THE FIRST PREMOLAR IN THE TYPICAL DENTITION OF THE PLACENTAL MAMMALS.*

By ANDREW WILSON.

THE number of species in which there are, in the adult, four teeth separating the canine from the molars, is considerable, but in very few of these cases are anatomists or naturalists agreed in regarding the one next to the canine as a premolar.

These are those in which the typical four milk molars are succeeded vertically by four permanent teeth, and, so far as observed, they are very few indeed. As examples in recent species we have the tapirs, and, according to Mr. Spence Bate, the mole.

In the vast majority, this tooth has neither had a predecessor nor will have a successor: and, while regarded by some as the first premolar, it is by others held to belong to the milk series, thus giving rise to considerable confusion, which is not lessened by its being occasionally counted in both.

As showing this confusion, I will quote a few extracts from great authorities. Professor Huxley,* writing of the Horse, says, "The tooth here counted as a first premolar may be a milk tooth, as it appears to have neither a predecessor nor successor, and soon disappears."

Of the Rhinoceri† "of the four milk molars, the first, as in the Horse, is smaller than the others, and is not replaced."

I may notice, in passing, that in some extinct Rhinoceri there was both a MM.¹ and a PM.¹ in the upper jaw at least.

Speaking of the Tapirs,‡ he says, "In the anterior premolar (or milk molar?)"

In this genus it is now known that there is, in the upper jaw both a MM.¹ and a P.M.¹ as is well known in the beautiful preparations lately added to the Science and Art Museum

* Read before the Odonto-Chirurgical Society of Scotland.

in this City. These consist of the crania of types of the several mammalian orders, having the milk series of teeth "in situ," while, the outer wall of the alveolar process having been removed, the permanent teeth are seen lying in their crypts.

I would strongly recommend members to inspect this most interesting and instructive collection.

Of the Pig,|| on one page he gives the adult formula as having PM_4^+ , then a couple of pages further on, and after giving the milk dentition as having MM_4^+ , he says, "The first permanent molar is the first tooth of the permanent set which comes into place (at about six months after birth), and the permanent dentition is completed in the third year, at which time the first deciduous molar, which is not replaced, falls out," and he then gives the permanent formula as having $P.M_3^+$.

Of the Hippopotamus,§ after giving the milk molars as $\frac{4}{4}$, he says, "The first deciduous molar persists a long time, and seems not to be replaced."

Treating of the Camel he says, "There are not more than five grinding teeth, in a continuous series, above and below," but he ignores the presence of the caniniform $P.M._1$ in the upper jaw, which is separated from $P.M._3$ by a diastema, PM^2 being suppressed.

One more quotation from him. Of the Dog,¶ he says of the anterior three premolars, "These teeth are two-fanged," when in reality the first is single-rooted, and almost rudimentary in form.

Again, the first premolar of the adult dentition, having no deciduous predecessor, so that in this, as in so many other cases, it is doubtful whether it should be counted in the milk, or in the adult dentition." "The so-called 'first premolar' of the adult, and anterior molars appear before any of the deciduous molars are shed."

Professor Owen, in his *Odontography* (pages 477, 484), says of the Dog:—"The first permanent premolar comes into place before any of the deciduous teeth are shed, its germinal predecessor disappearing before birth," and of the *Hyæna*, "The figure of the skull of the young *Hyæna Crocuta* . . . shows that stage when the correspondence

* *Anat. Vert. Animals*, p. 295. † *Anat. Vert. Animals*, p. 309. ‡ *Idem.*, p. 311.
 || *Idem.*, pp. 3R3, 317. § *Idem.*, p. 319. § *Idem.*, p. 328.

¶ *Idem.*, pp. 556—357.

with the formula of the genus *Felis* is completed by the appearance, in the upper jaw, of a small premolar in the interspace between the canine and the first molar of the deciduous series ; but this appearance is due to the apex of the first permanent premolar, which cuts the gum before any of the normal deciduous teeth are shed : whether it is preceded, as in the Dog, by a deciduous germ tooth in the foetus, I know not."

Mr. C. S. Tomes in his Manual is very unsatisfactory in his treatment of this tooth, in some cases speaking of it as a temporary tooth, in others as a permanent one, and even the figures and text contradict each other.

Lastly, in a footnote to the first page of the Introduction to vol. iv. of the Cat. Fos. Mam., Brit. Mus., 1886, we find it stated, "The author is inclined to believe that the first cheek-tooth in the Perissodactyla—which in *Tapirus* is always replaced by a vertical successor, in *Rhinocerus* is occasionally so replaced, but in *Equus* never had any successor, and is frequently absent—belongs to the milk molar rather than the premolar series." No notice being taken of the homologous tooth in either the Artiodactyla or the Carnivora, although any decision regarding the one must be equally applicable to the others.

Turning now to the reasons given in support of its being regarded as a milk molar, these are two—first, its not having had a predecessor, and, second, its being soon shed.

Having in the Mammalia many instances of the absorption of milk teeth in various stages of development "in utero," and seeing the contradictory statements made regarding the presence of such a tooth in the foetal dog, as evidenced in the quotations given from Owen and Huxley, much importance cannot be attached to the first reason. But, even supposing that there is no predecessor, we may put this reason aside, as we find that the same authorities who hesitate to recognize as an established fact that in the marsupials all the premolars, excepting the last, have had no predecessors, and that in some species, even of the last one, it is doubtful or not proven, so far as present knowledge goes.

Turning now to the second reason, its being in many cases soon lost, we find that while in some it is so, in many more it is long retained—the more surprising, seeing that it seldom is a functional tooth. A more important point would be the period of its eruption, compared with that of the undoubted milk molars, and coincident with that of the first permanent

molar. Supposing it to be a milk molar, we have the anomaly of its eruption being preceded by that of the second, third, and fourth milk molars, and coincident with, if not slightly after, that of the permanent molar. Now this, which would be remarkable if a milk tooth, would not be so if a permanent one; its early eruption, compared to that of the other premolars, could be explained by the fact of its having had no predecessor.

In man we frequently, I may say usually, find that when a milk tooth has had to be removed very early in life, its successor appears much sooner than would have been the case had it been normally shed. Still more to the point, in the only case in man in which I have met with a front permanent tooth, which had no temporary predecessor, it erupted long before any of the other permanent teeth, but after all the temporary ones. It did duty with the temporary series, and now, years after they have disappeared, it is doing so with its permanent colleagues. As to the periods, when what I claim to be the first premolar is shed, there is, unfortunately, very little data on record. In the carnivora we have it in place long after the full adult dentition, and in the bears it is in place long after the second and third premolars have been lost.

In showing the inconsistency of those objecting, on the first ground, I referred to their treatment of the marsupials premolars; and, as doing the same for the second, I point to a special tooth in the same group—namely, the penultimate premolar, as seen in the larger species of *Macrobatus* (kangaroos). This tooth is erupted very early in life—a young skull in my collection, in which the third upper incisor is just erupting, shows two cheek-teeth in place, the first, the tooth in question, with, to its distal side, the temporary molar. The first is shed, and its socket obliterated, in advance of the shedding of the temporary tooth.

In these species, its being so shed is thus not due to the eruption of a large last premolar (the reason given by Mr. C. S. Tomes in his *Manual*), but to the same cause, which, as the animal ages leads to the shedding of all the permanent cheek-teeth, except the third and fourth molars. Still there is now no hesitation in recognising this tooth as a premolar, although Owen regarded it as one of the temporary series.

In conclusion, I will just bring under your notice a remarkable peculiarity, occasionally met with in the first premolars, but seemingly rarely—namely, its being duplicated,

that is, we have, besides the second, third, and fourth premolars, *two* first. This occurrence, I suspect, is not so rare as records would lead us to believe, as there are two in my own collection—one in the upper jaw of a Dingo, the other in the lower jaw of a Bear. In both it is on the left side only, and in both the one next to the canine is the larger, and I venture to throw out the suggestion, may this smaller tooth not be the first milk molar, which is normally suppressed.

ARRANGEMENT OF TEETH.

By PROF. L. P. HASKELL, Chicago.

THE *Cosmos* for August contains an admirable article, entitled "Typical Tooth Forms," which is worthy the study of every dentist. I wish to call attention especially to the diagram marked "S," page 614, and the description on the previous page, a careful study of which will be a great aid in the proper arrangement of teeth.

It states that the tips of the six anterior teeth (in nature) form the arc of a circle, the centre of which is the width of the central, lateral and cuspid teeth.

A line at right angles to the median line, through this centre, will pass through the centres of the second bicuspids.

A second line, parallel to this, through the posterior periphery of the circle, will pass through the posterior edges of the second molars.

The teeth in the arch posterior to the cuspids are almost directly in a straight line toward the centre of the condyles, being deflected slightly inward at the anterior cusp of the first molar.

In the lower jaw, the four incisors are more nearly in a straight line than the upper incisor, and the direction changes sharply at the cuspid, and then forms a gentle curve along the buccal faces of the teeth.

I would suggest the dentist have a series of tin circle with handles from posterior edge. Select one for the case in hand by the width of teeth to be used, remembering, however, that the so common use of *small teeth* where they do not belong would result, under this rule, of very much circumscribing

the room for the tongue. I am not sure but it would be the means of teaching some dentists a lesson on this point.

To secure the proper arch to the grinding surface, a simple rule suggested to me by an old practitioner, I have found serviceable, as follows :

Arrange the *ten* anterior teeth so that they will be on a line when placed on a flat surface, and the molars dipping upward on an inclined plane.

Arrange the lower teeth so that when placed on a flat surface only the incisors and second molars touch.

"Circumstances alter cases," so there can be no inflexible rule for the arrangement of teeth, and the dentist must use his judgment. As for instance, in very pointed jaws, especially where the lower teeth remain, and form a V-shaped arch, the upper teeth should be so arranged that the centrals are the most prominent, the laterals inside the circle, and the cuspids still farther inside. This is a very common form of natural arrangement.

I would further suggest that the *teeth manufacturers* might study the article referred to with good advantage, especially in the formation of bicusps and molars. If they follow these typical tooth forms, we should be rid of the numerous imitations of anything but natural teeth, I refer particularly to *plain* teeth, *thin*, *narrow*, too long often by one third, with the lingual cusps of upper, as well as lower, longer than the buccal cusps.

VALEDICTORY ADDRESS.*

By WILLIAM HERN, M.R.C.S., L.D.S.

GENTLEMEN,—The time has now arrived when I have to deliver up to you the important charge which you committed to me, two years since.

In retiring from this post of honour and responsibility, I am imbued with a due sense of the many deficiencies and shortcomings of my Presidentship, but withal, with that spark of latent satisfaction of one who has tried to do his duty. It has afforded me great pleasure to be able to serve you notwithstanding my imperfections, and I desire to thank you all for the forbearance and consideration shown me at all times,

* Read before the Students Society, London Dental Hospital.

and under all circumstances during my years of office. The smooth and harmonious working of a society such as ours, depends in my opinion, much more on the members than on the President ; any measure of success or of progress, therefore, which may have fallen to it during my Presidentship, I recognize as due to the kindly interest in the affairs, and strenuous efforts for the advancement of the objects of the Society by the members generally.

This concern for the welfare of the Society has been demonstrated, I think, by the subject matters of the papers read before it. On looking over the Transactions for the past two years, I was impressed with the every-day practical subjects brought before us at each meeting ; indeed, one could arrange them in such progressive order that their titles seemed to read more like the index of a good text-book of Dental Surgery. The interesting and instructive discussions too, elicited, testify to their practical nature. It is encouraging also to notice the goodly number and variety of casual communications brought before the society at its several meetings. In regard to these, however, I cannot help thinking there is room for growth and multiplication. All are engaged in the same practice, encountering similar obstacles, and struggling with similar difficulties of manipulation, and, just as in a mountain climb, this torrent, and that rock or crevasse may be safely or expeditiously passed by different routes, all leading to the same goal—the summit—so these difficulties and obstacles are solved and overcome in different ways by different operators, and present to the observant mind a fund of practical points of interest and instruction for Casual Communications. Mr. Charters White has pithily said “ that Casual Communications often contain the germ of some practical application, which, being fertilized by discussion, becomes elaborated at the hands of others, and made available for the benefit of all.”

The Councils' and Treasurers' Reports, to which you have just listened, are encouraging and satisfactory—the latter fulfilling the requirements of sound finance, important in Societies no less than in individuals, viz., solvency—our expenses having fallen within our income during the year.

Gentlemen, I have no desire to tax your patience with a formal Valedictory Address. Farewells should be brief. I will therefore not detain you longer, but wish you and the Society a happy and prosperous New Year under the able Presidentship of Mr. Matheson.

AN IMPROVED FORM OF SAND-MOULDING FLASK.

By Dr. BOOTH PEARSALL.

THE sand-moulding flask I have the honour of showing to you to-night has been designed to meet some of the many defects we find in zinc discs as they are commonly made by dentists. This design has been the subject of a good deal of thought for many years, if one can be said to think a new design never put into practice, and I think anything that will aid us in our workroom labour by shortening labour—meaning tensile strength and decreasing waste—is worthy of attention. The sand-moulding flask before you was invented about eighteen months ago, as an experiment to see how far the Bayley flask and die could be improved upon, and has been in constant use in my workroom ever since it was made. During this time of constant use, the only improvement has been to have two patterns of moulding-plates, one with the cone-shaped aperture somewhat larger than the pattern before you, so as to suit very large jaws. The flask is made of two parts—a moulding plate and an iron sand-ring made to fit the plate.

The moulding-plate is circular ; the upper surface has four concentric grooves on its surface and four projectors or tabs ; the grooves are for holding the sand in such a way that the grooves make so many dykes or obstructions to prevent the hot metal running out between the moulding-plate and the surface of the sand surrounding the mould. The concentric grooves have another object, namely, to guide the workman in correctly centreing or ex-centreing the position of the model, so that the cone or the striking part of the die will come where it may be wished to have most strength in the die—in other words, where the heaviest hammering is to be done. On the other side of the moulding-plate are to be found four webs or feet running from the circumference of the plate to the aperture in the middle, which moulds the truncated cone for hammering upon, the object being to make the moulding-plate strong enough to stand rough usage, of sufficient weight to prevent the moulding-plate from floating off the sand mould by the weight of the melted metal as it is poured into the mould, as well as to form steady feet for the

plate to rest on in the sand-moulding trough. The iron sand-ring is made of strong hoop iron in the usual way, and it should fit easily and truly on the grooved surface of the moulding-place next to the projectors or tabs.

When sand-moulding is to be done, the moulding-plate is placed in the sand-trough grooved side *upwards*, and on it the shallow plaster model (from $\frac{3}{4}$ to 1 inch deep, as may be desired). The model is either correctly centred by the aid of the grooves, or it may be put out of the centre so as to bring the cone-shaped aperture wherever it may be desired. The position of the plaster model having been determined, the iron sand-ring is put on the moulding-plate surrounding the plaster model. The sand is then packed in in the usual way, and when the packing is finished, the iron ring full of sand and the moulding-plate are turned upside down, the moulding-plate removed, exposing the plaster model, which is then removed by the aid of a point and a hammer in the usual way.

The mould having been examined and any loose particles of sand blown out of it, the melted zinc can be poured into the sand-mould and the moulding-plate put over the mould, and the remaining zinc poured in to make the coned end of the die. If the sand-mould is not quite filled with zinc, there will not be any difficulty in placing the moulding-plate on the sand-mould, but if the metal is poured in a slovenly way, there is no doubt that a difficulty will occur, the over-flow of metal preventing the moulding-plate from going into its place. With skilful workmen and ordinary care, the pouring of this die is just as easy as any other form.

In use, the swaging of a plate will be found more certain and accurate because of the case with which heavy blows can be struck on the truncated cone, and if the section of a die be examined, the hollow formed by the cooling of the zinc in the centre is really a source of strength, so far as the construction is concerned.

The cone-shaped end, with the model projecting over it, enables the die to be held in a vice in such a way that blows struck on the palate or teeth of the model will not cause it to slip in the jaws of the vice, but has a steady bearing, forming a great contrast to the slippery and uncertain hold of the ordinary form of die when placed in a vice to be filed or hammered, and it can be easily turned round when the jaws of the vice are opened, and instantly tightened again in the desired position, whereas the Bayley or ordinary form of die

cannot be secured with the same certainty, precision, or rapidity in a vice. You will also notice the ease with which blows can be struck outside of the cone on the shoulder formed by the projection of the mould under the cone, and such blows are often of the greatest service in certain cases, the instances of which will readily occur to practical minds.

The advantages may be summed up as follows :—

1st. Saving in the amount of metal to be melted, as zinc deteriorates by constant melting ; this is important, as the usual supply of zinc ought to go farther in the constant use of smaller dies.

2nd. The ease with which a shallow plaster model can be removed from the sand as compared with a deep one.

3rd. The great increase of strength, owing to the improved construction of the die, aided by the cooling of the zinc.

4th. The ease and rapidity with which the new form of die can be held in the ordinary vice.

5th. The certainty of blow secured by the use of cone-shaped end of the die.

6th. The choice offered to the workman in placing the strength or blow-resisting cone where it is needed to resist heavy hammering.

7th. The ease with which the hammer surface of the die can be struck with a heavy hammer.

8th. Simplicity of method, the details being nearly the same as those used in the dental workroom.

In diagram No. 5 you have sections of the same model used as a die in my method, the usual method, and that invented by Bayley. I have to inform you that manufacturers, so far, cannot see any advantage in my method, and one firm have generously offered to *connect my name with the invention* if I will place my invention in their hands without any remuneration for the cost of experiment and wear and tear of brain substance, and they have informed me that I shall have great difficulty in converting dentists to the use of my form of die. That there is great scope still to be found in the improvement and increased efficiency of work-room tools, I have no doubt, and I hope from this time forward to do something to make our workroom places where work shall be an enjoyment, not a sorrow. Whatever may be said about American inventions, and the appreciation shown whenever any good and practical invention is placed in the hands of our profession, I do not think the British dental manufacturer can lay claim to any credit in promoting or fostering inventions of any kind

amongst us until the demand for the newer and more efficient appliances of the men of progress has become so marked on the part of dentists that they cannot avoid "going with the times." I do not think the difficulties and inconveniences found in connection with the forms of metal dies have been sufficiently studied by practical dentists ; and I trust you will find, by practical experiment, that I have done something towards making dies something less of a worry and something more of a pleasure than they have been found in the past.

POSITION OF DENTISTRY IN ITALY.

By C. H. DUNN,, L.D.S.

FOR the last 10 or 12 years there have been efforts made for the progress of the dental profession in Italy by some Italian dentists. There have been two Societies formed among them, and about 12 years ago the Italian Odontological Society numbering about 100 members.

The Society met in Congress once a year for five or six years it then sunk into an apathetic condition, for some years, was very nearly dissolved in the fall of 1888, but by vigorous efforts was rescued from impending dissolution and met in November, 1889, in the city of Genoa, with a fair attendance of members from the different cities of northern and central Italy.

The other Society formed at about the same time is the Florentine Dentists' Society. This beginning with five or six members has prospered in every way ; it now numbers about fifteen resident members and several honorary associates. It holds its meetings monthly and discusses scientific and other subjects interesting to the Profession.

It has for several years had a Dispensary for Operative Dentistry open every morning for two hours and has proved itself to be a most useful school for young Students who have frequented it.

It also publishes monthly its Transactions in a Journal.

These two Societies have tried and are trying at present to induce the Ministry to modify the projected law in such a manner that students of dentistry should be able to have a special course of study of two or three or four years at most. Whereas the new regulation applying to dentistry in the

Sanitary law which will shortly be brought before Parliament, proposes that all dental students should first qualify as medical men. In this way everyone wishing to qualify himself so as to practise as a dentist in Italy would have to pass six years in studying medicine, and then—but the law does not say what then he is to do,—and I cannot pretend to clear up the difficulty.

The two Societies are moving in the matter, while that of Florence is compact and united, the members understanding what they desire, those of the Italian Odontological are all divided in opinion, and as the members live one or two only in each city of Italy, it is a matter of no little difficulty to get their co operation so that it should have some practical utility.

The Profession in Italy therefore is in an unsettled and an uncertain state. There is a great desire to do good on the part of the Minister of Public Instruction, but his advisers in this particular point seem to have had no practical knowledge of the matter.

The king, you may be sure, has plenty of subjects to occupy his attention, and will leave the solution of the Dental difficulty to others who ought to be more interested in it than he.

SANITARY SCIENCE AND ITS RELATIONS TO THE CONSTRUCTION AND ADAPTATION OF PROSTHETIC DENTURES.

BY PROF. N. S. HOFF, Ann Arbor, Mich.

It would seem that at this time there ought to be no occasion to call attention to such a subject, but the frequent presentation of disease of the oral cavity, caused unquestionably by faulty construction or adaptation of plates, bridges, crowns, etc., assures us that there is no impropriety in discussing it.

These manifestations clearly indicates the fact, that, in the effort to supply the popular demand for cheap dentistry, the fundamental principles of the dental artisan are not only being usurped, and the artist himself degraded, but the high privilege of the professionally educated dentist, viz., the preservation of the dental organs in a condition of health and

integrity, which shall conserve the general health by maintaining and promoting the specific function of these organs, and rendering them incapable of inoculating other contiguous or remote organs of the system with disease, is either not sufficiently impressed upon the minds of many dentists to exert for good the power it should ; or it is wilfully and criminally ignored.

Great progress in the art of surgery, general therapeutics, and sanitary science is being made, because of the application of the knowledge of the influence which micro-organisms exert in the propagation of disease. Entertaining the belief that these micro-organisms exert an influence for harm in connection with the surgical, therapeutical and sanitary treatment involved in the preparation of the mouth for, and the construction and adaptation of artificial substitutes for natural teeth, we desire to call attention to this phase of the subject, with the hope that some suggestion may be made, which, if it should not prove to be of practical value, will excite an interest that shall lead to investigation and valuable results.

It is not my purpose in this short paper to set forth the definite relations of bacteria to my subject, or give in detail specific treatment—for I could not do so if I had the time and space—but to show that there is a probability that a recognition of the principles of bacteriology in treating diseased teeth for crowns, bridges and plate dentures, and in the construction and adaptation of these dentures, will not only result in the comfort and health of our patients, but in the usefulness and durability of the appliances.

Prof. Miller has successfully demonstrated the presence in the mouth of a great variety of micro-organisms, while only a few of these have been isolated and their peculiar activities discovered, enough is known to convince us that there is no putrefaction of extraneous matter in the mouth, except in the presence of some form of bacteria, they are omnipresent of necessity. Whether these bacteria are pathogenic in themselves or not is immaterial ; for it is known that by their functional activity the putrefaction or dissolution of the accumulated food debris in the mouth is accomplished, and the various chemical elements composing it liberated, to again unite with each other, the chemical constituents of the air and other favourable material that may be near by, to form new compounds, capable of destroying living tissue, or at

least impairing its functional activity by over stimulation to such an extent as to produce disease in the part.

That we have in the mouths of many people, wearing artificial dentures, crowns and bridges, all the requirements needed for the successful cultivation of bacteria, "goes without saying" almost, when we remember that these requirements are (a) body temperature, (b) moisture, (c) a suitable media—accumulated food stuffs—(d) the presence of a germ or spore to start the process. And to make the conditions even more perfect some germs are *aerobic*, that is, they are most vigorous in development in the presence of a limited supply of oxygen, which they readily get from the air passing through the mouth. Since these facts are brought to our attention, and we learn that these germs exert a destructive as well as a salutary influence, which knowledge is being used to great advantage in other departments of medical and dental practice, is it not our duty to make such application of it to dental prosthesis, as reason and judgment based upon experience and experimental investigation will warrant? How then shall we apply it? Our first endeavour must be of course to stop the process of putrefaction, and we can only do this by withdrawing some or all the conditions necessary to its existence, substituting the artificial for nature's method of removing collections of extraneous matter from the mouth, we must direct our attention to the micro-organisms or their food. While this may be assured that it can be accomplished to such a degree at least as to render the influence of the germs so insignificant as to be no longer deleterious. How shall we free the mouth from these germs and prevent their accumulation and destructive influence?

By removing from the mouth everything that would favour their introduction and growth. Diseased teeth and gums should be cured, deposits on the teeth removed, and special attention given to the construction of all mechanical appliances that are to be placed in the mouth, making the attainment of cleanliness, in this connection at least, of first consideration. All hopelessly diseased teeth or roots, that may because of their diseased condition, cause or favour the production of germs, should be removed from the mouth. Teeth which may stand out of proper position in the arch, or are so inclined as to make it impossible to secure an accurate impression, or that will interfere with a snug adaptation without leaving large spaces about the plate for the retention of food,

should be extracted. All roots that cannot be treated, filled and made healthy should be extracted. If retained they should be antiseptically treated and filled, and if they are not to be used to support crowns or bridges, should be dressed down to the gum and left smooth with no overhanging edges. All teeth that are to be retained in the mouth should be carefully cleansed of calcareous deposits, the gums, if congested or diseased, treated and restored to a normal condition before taking an impression, this work is often done (or not done at all) after the impression is taken and the plate made, so that spaces for the accumulation of food debris under and around the plate is the result.

It is possible that many cases of so-called rubber poisoning, seen in the mouths of persons wearing vulcanite dentures, can be accounted for by badly adapted plates which retain accumulated food stuffs until putrefaction takes place and their chemical elements being liberated from new chemical compounds capable of destroying living tissue, or which by their stimulating and irritating effect produce a chronic inflammatory process. Some forms of bacteria seem to possess the power of forming by their presence a chemical compound, called a *ptomaine*, which acts as any other chemical poison by producing its characteristic effects, not only locally but in the general system. The bacteria found in the mouth have not yet been sufficiently studied to establish any theory as to their functional activity. We simply know they are present under certain known conditions, and from what we know of the activity of micro-organisms in other relations to the body in a state of health and disease, we are justified in believing that they may take some part in the destructive processes of the mouth.

We do not wish, had we the space, to take up the consideration of the subject of the treatment and filling of roots, preparatory to making them serviceable in crown and bridge-work. Every dentist thinks he has as good a method as any one else. But I would insist that this should be done in the most thorough manner by the most approved antiseptic methods. A most excellent paper on this subject appears in the Dec., 1889, *Dental Cosmos*, written by A. Retter, D.D.S. Utica, N. Y.

Briefly a word or two on the construction of dental substitutes. After an accurate impression has been secured, the selection of a proper material for a base is important. Without taking into consideration all the ordinary requisites of a base

upon which to mount teeth, we will only call attention to those qualities that are essential to the construction of a plate that will secure a sanitary condition of the mouth. It must be a material that can be closely adapted to the mouth, that will have sufficient stability and elasticity to admit of the force of mastication without permanently changing form; one that can be neatly finished and highly polished and to which the teeth can be attached in a substantial way without providing spaces for the accommodation of food *débris*; and one that will not absorb fluid substances from the mouth and thus become, if not in itself filthy, incapable of being thoroughly cleansed.

In this connection it may be necessary for us to narrow down to one style of denture, in order to accomplish this object, namely, what is known as continuous gum, for in fact this style of denture is the nearest approach to a clean plate that we know of. Gold or silver plates for partial dentures with soldered teeth are comparatively clean, and likewise gold plates with rubber attachment where the work is carefully done and the rubber properly vulcanized, but there is so much faulty work done that even these plates are difficult to keep in a sanitary condition long enough to pay for their construction. The cast metal plates are easily made, can be closely adapted and are easily kept clean, but they have other disadvantages that would rule them out in many cases. Rubber and celluloid plates are objectionable because it is almost impossible to keep them clean after they have been worn but a short time.

Bridge-work is usually bad because of the fact that it is so constructed that it cannot be readily cleansed by the patient. Even the small bridges and the removable bridges are difficult to cleanse, they cannot be made so as to be reliably self-cleansing. But after all bridges are not so likely to produce diseased conditions of the mucous membrane, for the reason that they do not come into as close contact or to as large an extent as plates, and the germs and their products are rubbed off during mastication, diluted with saliva and carried into the stomach where they are either destroyed by the gastric juices or rendered harmless. The mucous membrane is kept continually irritated by the presence of the germs and their products under and about a plate.

Crowns if properly made and adapted are unobjectionable. They should imitate the natural teeth as perfectly as possible in size and form, thus securing a continuous masticating

surface with the V-shape space for cleansing. If collar crowns are used, the collars should fit accurately, pass beneath the gum margin but not enough to leave a space between collar and root, or to encroach unnecessarily on the periodontal membrane. Porcelain, pin and pivot, crowns should be accurately adjusted and frequently examined to provide against spaces being caused by their derangement.

If we have not presented this matter in a practical and satisfactory manner we will hope to have drawn attention, by suggestion, to a subject that will bear investigation with a probability of satisfactory results. If a study of the relations of prosthetic dentistry to sanitary conditions of the mouth is encouraged, there is no question but it will result in more care in the selection of suitable materials to be used, as well as in more artistic construction, and a branch of the profession that is fast being turned over to the tyro or charlatan will be rescued and made attractive to the many bright young men now entering the profession.

CEDAR-WOOD CANAL-POINTS.—Red cedar *properly and thoroughly prepared* is, Dr. James Beebec thinks, the best. Having split red cedar into small pieces the size of an ordinary match or even smaller, place them in paraffine, heated almost to the boiling point. Allow them to fry in this material till all the moisture is expelled and the wax thoroughly permeates the wood. Allow the paraffine to cool, then again raise the temperature sufficiently high to scorch the wood a *very little*. Cool again, then reheat. The heating and cooling allows the paraffine to thoroughly fill the pores of the wood. The reasons for preferring this material are that the red cedar is almost indestructable, and though a very dense wood it is also very soft, and when driven into the tooth will adapt itself to the form of the canal. The paraffine renders it impervious to moisture and makes it easy of removal if desired. As a disinfectant and antiseptic, chloride of zinc may be applied to the walls of the canal previous to insertion of the paraffine cedar.

British Journal of Dental Science.

LONDON, FEBRUARY 15th, 1890.

STUDENTS AND THEIR SOCIETIES.

ONE of the most noticeable features about the educational movement which has during the past decade characterised the progress of dentistry, has been the activity of the dental students. Not content with "getting through their exams." they have sought for and found vents for their ever increasing energies. Those who take an interest in their work have searched for new empires to conquer, in the general hospital or examination hall, and those whose tastes have not commended book-learning to them have clamoured for students' dinners, students' football clubs, tennis, cricket, or athletic associations, and pitting themselves against the medical students have strained every sinew to be neck or nothing in their friendly contests. In another direction this healthy spirit of emulation has developed an epidemic of students' societies, societies to which the students flock in numbers and read papers, hold discussions, and exhibit models, and in fact conduct themselves after the approved type of the "grave and venerable seniors." In London and in the provinces these societies bristle forth as soon as a dental school is established. One at least of the societies prints and publishes its transactions, and produces a very creditable volume year by year. The failing which seems to be stereotyped in English societies is the absence of really practical work done at their meetings. In the older societies here is some reason for this as they are more especially

taken up by pedagogic papers and discussions, and afford a most valuable platform upon which questions of pure science can be discussed and their bearing upon dentistry considered. This does not apply to the students' clubs and the attempt too often made by students in the first, second or third years to read didactic paper upon some question which has vexed their seniors for a generation or two must result in *fiasco*, as far as the good the society derives from it goes. In the first place such a student can only boil down the text books, and present to his compeers notes of books with which they are or should be quite familiar, or offer them opinions which based upon two or three years' limited experience cannot be of any value, while secondly the time of the Society is taken up about a matter which may have little or no interest for the bulk of those present, while the discussion is necessarily burked, since all the text book information obtainable has been collected, if the writer is in any sense careful in his compilation, and so his fellow students can only fall foul of the opinions expressed by the writer, who very justly may retort that his opinion is as good as theirs, seeing they none of them know much about the matter. Are Students' Societies then all valueless, a mere collection of mutual admiration meetings? To us it seems emphatically that such is not the case, they, to our mind, subserve a most valuable and useful end, but we think that end cannot be gained unless they are run upon different lines. The Casual Communications should occupy the most important place, in fact should take the rank which now the paper holds, and the paper, if time permits one to be read, should be limited to a period of say ten minutes, and an option should be permitted to practically minded students to replace it by a demonstration on some practical point. It may be urged that the lack of experience which renders the value of a paper so slight, would also stultify a demonstration of any but a senior student. This, we submit is not so, for many students give proof early in their career of being able to take up some line of manipulative skill, and easily distance other students, who perhaps have devoted far more time to that particular line. Again, students

are more at home in discussing a new burr, a supernumerary tooth, a new flask, or some fresh departure in gold filling; than when called upon to call in question some abtruse disquisition upon the Premolar or Causes of Pyorrhœa, etc., especially when the wise reader of the Paper states for his conclusions, the deductions of Tomes, Salter, or Goodsir. It matters little how details of management are settled, the broad basis of our contention is that Students' Societies should, as far as possible, limit themselves to practical matters.

LINKING LOOSE TEETH.—Much benefit will result from the fitting of platinum or gold bands to loose teeth, and linking them together with solder and cementing the string of bands to the crown of the teeth. Dr. G. W. Nichols, of Chicago, according to the *Dental Review*, was the first to propose this method of holding loose teeth, in an immovable position, some dozen years ago. An impression is taken, and if the teeth are very close together, they are cut off the model, and the narrow bands are fitted to the individual teeth, and held together with gum dammar, or other adhesive substance, tried on the natural dried teeth then soldered together and afterwards cemented on the teeth. The rubber dam should be applied, and allowed to remain for some time, and then cut off.

THE ONESIDEDNESS OF FACE is well illustrated by a brief notice in *Items of Interest*, pointing out how seldom the nose is the true centre of the face.—Try to find the median line of a person's face, by tracing it from the tip of his nose, and see how you come out! Many people who imagine their noses are perfectly straight would find by a close inspection that those appendages gee or haw a little—perhaps to their amusement and maybe to their chagrin.” A Portland dentist tells a story to the point. Says he: “After I had fitted a set of false teeth to a lady, she exclaimed: ‘Why! you haven’t got the middle of the set in the middle of my face.’ “I looked again, and thought I had. “‘But just look at my nose!’ said she. ‘The middle of the set certainly is not in

line with the middle of my nose.' "That may be," said I, "but your nose—" "Do you mean to tell me that my nose ain't straight?" "I think you will find that is the case. "How much is your bill? I'll pay it, and you can keep your old teeth!" "She paid the bill, threw down the set, and flounced out as angry as an angry woman could be. She went home, her friends told her how foolish she was, she lay awake all night, and the next day came back, apologized, and had her work finished."

PRINTERS AND THEIR ALLIES will be very glad to know, says the *Scientific American*, how to prevent screws from becoming fixed with rust. It is well known that iron screws are very liable to rust, more especially when they are placed in damp situations. When employed to join parts of machinery they often become so tightly fixed that they can only be drawn with considerable trouble—a fracture sometimes resulting. In order to avoid this inconvenience, screws are generally oiled before being put in their places; but this is found to be insufficient. A mixture of oil and graphite will effectually prevent screws from becoming fixed, moreover, protect them for years against rust. The mixture, facilitates tightening up; is an excellent lubricant and greatly reduces the friction of the screw in its socket.

TO CURE BROMIDROSIS.—Sufferers from foetid sweating will be glad of the following formulæ.—For ill smelling feet:—after carefully washing the feet, which should be done night and morning, apply an alcoholic lotion, methylated spirit and water, and then turning the socks inside out powder them thoroughly with the following,—Talc 40 parts, Bismuth Subnitrate 45 parts, Permanganate of Potassium 13 parts, and Salicylate of Soda 2 parts. For perspiration from the axillæ, &c., Powdered rice 60 parts, Subnitrate Bismuth 25 parts, Permanganate of Potassium 10 parts, powdered Talc 5 parts.

THE DENTITION TEST FOR CATTLE.—The disqualification of cattle at the Smithfield Christmas fat stock show has, as we expected, caused much dissatisfaction amongst several exhibitors, says *Land and Water*. "A Breeder and Feeder," writing to an agricultural contemporary on the subject, insists that the dentition test is unreliable. He says :—I should have been glad to have learnt the breed of the majority of the animals that were disqualified by the test. I am disposed to think that Herefords would form the majority, that breed of cattle being most misleading in the dentition test, not only in youth, but in old cattle. The front teeth of a Hereford cow, eleven or twelve years old, would in nine cases out of ten be worn down as small as a calf's teeth, whilst an Alderney cow, fifteen or sixteen years old, would carry her front teeth as broad as ever. Bulls especially, of any breed, are very forward in teething. Only a fortnight ago I had occasion to examine the teeth of a bull three years old in April next. He showed four years old, well up. I also remember buying a pair of Hereford steers two off, and when I came to examine their teeth found them to show four-year-old. With regard to teg sheep, yeaned within a fortnight of each other, one may have two broad teeth well up before the other has shifted a tooth, although both from the same flock. I have a colt of my own breeding, foaled on May 21, 1886, that the veterinary inspector, or any horse dealer would buy for coming five, having all his corner teeth in. Far be it from me to cast any doubt on the sincerity and honourable intentions of the veterinary inspectors, but from twenty-five years' experience and observation, I am convinced that the dentition test is unreliable, and ought not to upset and so ignore the written declaration of a highly respectable class, and men of honour, as our exhibitors undoubtedly are. I could have multiplied instances and have gone into details in words that the general public would have understood, but the class whom this matter most closely concerns will understand every word I have written."

Abstracts of British & Foreign Journals.

INTERNATIONAL DENTAL JOURNAL.

FERMENTATION : ITS CAUSE AND EFFECTS.

By ERNEST LAPLACE, A.M., M.D. (Paris), Professor of Pathology in the Medico-Chirurgical College, Philadelphia.

THE brewer learned from long experience the conditions, of success as his beer had gone bad without any accountable cause. While still a young man, Pasteur, who was then a professor of chemistry in the Ecole Normale, of Paris, was attracted by a note of the German chemist Mitscherlich, in which he said to the Academy of Sciences : "The tartrate and paratartrate of soda and ammonia have the same chemical composition, the same crystalline form and angles, the same specific weight, and the same double refraction. Dissolved in water, the refraction is the same. But the dissolved tartrate turns the ray of polarized light to the left, whereas the paratartrate is *indifferent*. But," adds Mitscherlich, "the nature and the number of the atoms is identically the same." Pasteur, then discovered that the crystals which turned polarized light were not symmetrical. He noticed that all products of organic life were dissymmetrical, such as starch, quinine, strychnia, etc., while all mineral crystals, or products of the inorganic world, were symmetrical. He immediately suspected that tartrates were organic,—that is, connected directly or indirectly with life. It was a well known fact that a German manufacturer of chemical products having thrown away some impure tartrate of lime, mixed with albuminoid materials, this had fermented, giving rise to different products. Pasteur reproduced the fermentation in the following way : Taking some tartaric acid, he added a certain amount of albuminous material, and placed it in an incubator. When fermentation had taken place, Pasteur found innumerable small living organisms, and after the process had stopped he polarized the liquid, and found that, whereas before fermentation the polarisation was to the left, it had now turned to the right. His suspicion was realised. Hence, this sudden change of the direction of the ray of polarised light was accompanied by a great development of small living organisms during a process heretofore known simply as

fermentation. Up to this time the most incomplete notions had been entertained as to the true cause of fermentation. Liebig said "it was an acidification of albuminous substances when in contact with air;" Gay Lussac thought that the oxygen of the air was the causative agent, for he had noticed that wine had turned sour from being poured from one vessel into another; Berzelius and Mitscherlich said that ferments acted by catalysis—that is, by their presence; Schwann and Cagnard Latour noticed that a living rounded body was present in the manufacture of beer, but it did not occur to them to ascertain what part was played by this organism. As soon as the malt is mixed with hops it is boiled and allowed to cool; this infusion is called the wort, and that is placed in vessels with but one aperture open to the air. Here it is mixed with the yeast. Soon after a brown froth forms on the surface, which is really new yeast, and issues from the aperture falling like a cataract into troughs prepared to receive it. Whence is this new yeast? Liebig was loath to accept the growth of this plant as the cause of fermentation, and maintained that its life had nothing to do with the process, that it was a purely chemical one, and that it was the chemical nature of yeast, not the fact that it was alive and could develop life, which produced fermentation. In a memorable demonstration, Ludersdorf proved the error of Liebig's assertion, and that yeast acted as a ferment because of its organised or living character. He destroyed the cells of yeast by rubbing them on a ground glass plate, and he found that, with the destruction of the organism, the chemical nature remaining the same, the power to act as a ferment disappeared totally. But in the manufacture of wine no yeast is added. The grape is pressed, and the juice ferments after a short while. The torula soon make their appearance, however, and where do they come from? If the filtered grape-juice be boiled, so as to destroy the germs it contains, and be put in germless air, it will never ferment. Pasteur has pushed this demonstration still further. The grape is sealed by its own skin from contamination by the air. He contrived a way of extracting the juice without its touching any contaminated substance and placing it in pure air; it did not ferment; then taking the skin of the ferment; then taking the skin of the grape and brushing the delicate grayish dust upon this non-fermenting juice, fermentation soon developed, and the yeast-plant appeared in great abundance; proving that the grape carries its yeast upon its

own self. The germ of the yeast-plant exists in the air, but not in quantities sufficient to insure rapid fermentation, such as the brewer desires. Pasteur has defined fermentation as life without air. These germs live on oxygen, as we do, and give off carbonic acid gas ; but they do not take their oxygen from the air, they take it from the substance upon which they grow ; hence they do not need the oxygen of the air for their development. Hence fermenting substances are placed in vessels with but a small aperture to the open air, where the yeast imbibes oxygen and pours forth carbonic acid. Where does it get the oxygen? It is taken from the liquid upon which it grows ; liberates carbonic acid gas, and leaves the liquid product as our familiar alcohol. And in the same way exposing alcohol to the action of the ferment known as the *mycoderma aceti*, acetic acid will be the result. The air is full of germs of ferments differing from the alcoholic leaven. Expose milk to the air, and coagulation will take place ; small globules of butter appear—the butyric acid fermentation. Within a short while larger organisms are seen wriggling in swarms through the preparation. In curdled milk are found other organisms linked together, as beads on a string—that is the lactic acid fermentation. Examine putrefying milk, and it will be seen to swarm with millions of small and larger germs, showing wonderful alacrity of motion. Keep your milk from the influence of the atmosphere, or boil it so as to kill the germs within it, and it will remain sweet, the germs being destroyed. Expose meat to the atmosphere, and it will soon putrefy, it will swarm with the germs of putrefaction, and will soon stink. Keep the germs away, and it will not putrefy. Thus we begin to see that within the world of life, to which we belong, there is another world requiring the microscope for its discernment, but which, nevertheless, has a most important bearing upon our welfare. From these facts we see that there are two elements always in action, a seed and a soil ; the seeds are floating continually in the atmosphere about us ; the soil is the particular substance upon which these fall, and at the expense of which they grow. All germs will not grow on the same soil. But a very astonishing fact is that one germ, after developing in a particular soil, may leave that soil in such a state as will render it favourable to the development of a germ which could not have developed there before. Such is indeed the case with the *mycoderma aceti*, which could not have developed in the sweet solution. First, the

yeast-plant developed there, changing the sugar into alcohol, and now the mycoderma aceti, falling into the alcohol, grows abundantly, changing this alcohol into acetic or vinegar. The most important and practical portion of the whole knowledge of the nature and development of micro-organisms is the study of the changes incident to their growth in the soil upon which they develop. The yeast-plant left the sugar changed into alcohol, whose chemical nature and physiological effects are quite different from sugar. The mycoderma aceti has changed the alcohol into vinegar, whose chemical nature and physiological effects are vastly different from alcohol. Likewise the lactic germ has produced in milk, which was once sweet, a substance (lactic acid) having corrosive properties, and which curdles the milk. This new product, which results from the decomposition incident to the development of a germ, is called a ptomaine. And would a substance putrefy without the action of germs? In other words, is there such a thing as spontaneous generation? Tyndall's and Pasteur's admirable researches have set this question at rest. One will suffice. Having made veal broth, Pasteur placed it in a round vessel, with but a small aperture. This was raised to a temperature of 115°C . for half an hour, so as to destroy all the germs within it, and the tip end of the flask was soldered, so as to prevent further air from coming in contact with the broth. A number of flasks so treated were placed aside. One thus prepared has remained pure for several years. This shows conclusively that by heat he had sterilized the liquid and interior of the flask, thus preventing any germs of the atmosphere from and, having soldered the end of the flask having access to the fluid, there was no possibility of life developing in it; hence it remains pure, and is likely to remain pure indefinitely. Do we wish to stop fermentation, putrefaction, contagious and epidemic diseases, we must repeat Pasteur's experiment,—sterilize first; then prevent the germs from having further access to the parts thus purified. Lister, in England, was the first to make a practical application of this to suppuration in wounds. He saw the analogy between the foul smell of a suppurating wound and the process of putrefaction, and concluded that, should he succeed in destroying the germs which had started this putrefying process, and should he prevent further germs from having access to the wound, this putrefaction would cease and the wound heal kindly without suppuration. This he did by sterilizing the wound. There are two ways of sterilizing:

(1) by heat; (2) by chemical agents: carbolic acid, sublimate, etc., which have the property of destroying the vitality of most micro-organisms; and when used in proper strength, do so without impairing the tissues with which they come in contact. The wound is then covered with several layers of cotton that has been sterilized or purified by heat,—and this prevents the germs of the air from having further access to the wound; for as these germs fall upon the outer layers of the cotton, they are caught by the meshes of the small cotton fibres and are not allowed to get any nearer the wound; during this time the normal and unimpeded process of repair goes on, and healing takes place without suppuration or putrefaction produced by germs. Applying these same principles to dental surgery, we are struck by the frequency of processes of putrefaction or fermentation in the mouth. And why? Because the germs of the atmosphere, which we constantly breathe through the mouth, lodge upon some remnant of food buried in the sulci, fissures, and proximal surfaces of the teeth, and find there a suited soil, accompanied by heat and moisture; these germs develop and cause putrefaction, as evidenced by the foul odours from the mouth. Besides putrefactive processes, a fermentative process also may take place in the presence of sugar which produces a corrosive element that destroys the enamel. The germs sink into this impaired spot, and the same deleterious agent being generated there, the process of decay attacks the dentine, the pulp, and an extensive cavity follows. Such being the case for a healthy tooth, well paved with enamel, the process is a much easier and more rapid one when through some accident a mechanical abrasion already exists. The writer urges the importance of Listerism in dentistry. To reach this end, sterilize, and prevent the further access of germs to the parts. Sterilise with the acid sublimate solution, destroying the organisms at one sitting. But when the pulp is dead use the heated platinum broach in the root-canals, then use the antiseptic solution, which will penetrate the minute nooks of the cavity, and destroy those few germs that have perhaps escaped the heat; finally, plug the tooth with aseptic or antiseptic filling.

INTERNATIONAL DENTAL JOURNAL.

BRIDGE AND CROWN-WORK THIRTY-FIVE YEARS AGO.

By D. C. ESTES, D.D.S., Lake City, Minn.

In 1853 he was a student in the dental office of one Dr. Dumon, in the city of Albany, N. Y., and, after a few months of study and practice, was able to do all the mechanical work connected with the office. His preceptor was a skilful operator, a very close-mouthed, shrewd business-man, and had, for those days, a large practice. He advertised very extensively, and often boasted in the *press* of the amount of work he was doing; and in consequence of this course he was, so to speak, an isolated dentist, having but little communication with the local members of the profession. In the insertion of artificial dentures he was proficient and successful and resorted to about all the methods known to the profession of to-day. What is now known as bridge-work he practised. Some three years after this time the writer became intimately acquainted with Drs. Douglas, Wood, and John Austin, who were then practising in Albany, and he made the bridgework known to them. The only two pieces of bridge-work which were done in the office are described. *First Case.*—The insertion of the right inferior cuspid and the adjoining bicuspid. The root of the cuspid remained, while the bicuspid had been extracted. The root was first carefully treated, drilled, and shaped, an impression taken, models made, dies cast, and a gold plate about one-quarter of an inch wide swaged to fit over root and all. Then a hole was punched in the plate directly over the root-canal, as indicated by the impression, a gold pivot inserted and firmly soldered. A short clasp to partly grasp the second bicuspid was then attached, after which the trial was made, and the articulation perfected in the usual manner. Common, plain plate teeth were then backed and soldered to the plate or bridge. The final adjustment was accomplished by partially filling the root-canal with amalgam and pressing the pivot and plate firmly into place. Just above the gold clasp, on the second bicuspid, a cavity was drilled, and a projecting gold filling inserted to keep the clasp and that end of the plate firmly and permanently in place. This job was a beautiful piece of work, *Second Case.*—A young man had had the two central superior incisors knocked out and the two laterals broken off. The roots were excised, nerves extracted, drilled, and other-

wise properly shaped, and then, as in the first instance, a bridge or narrow plate, with metal pivots, constructed and inserted precisely as in the preceding case, only there were no clasps on the adjoining teeth. The metal pivots were slightly notched, but not, strictly speaking, barbed, though answering the same purpose. About the then termed pivot-teeth, but was really crown-work then as much as it is to-day, he says: In the first place, every root was thoroughly treated and medicated, no matter what the time and labour required. Creosote was his great medicament, and in his hands appeared to be really a specific, for with it he cured all ulcers, so that, after the insertion of a pivot, no evil effects were discernable. The thorough preparation of the root was the secret of his success, for to solidly attach the crown was much more easily accomplished. The same for many years has proved true in my own practice. Both wood and metal were used as pivots, which were cemented in place with either amalgam or gutta-percha, or what was then known as "Hill's stopping." To use the latter, the pivot was well warmed, and enveloped in it, and while in a soft state inserted in the prepared canal of the tooth, and then pressed or driven home. In case of a badly-decayed root, all the carious parts were first removed, then the root properly medicated (ulcer cured) and drilled, after which a temporary polished brass pivot was inserted. Around this, amalgam was firmly packed with fine instruments, and the lost parts of the root built up up until a firm base for the crown was secured. The slightly projecting end of the temporary pivot was covered over with gutta-percha or wax, and the patient dismissed until next day, when the brass pin was removed, the root further shaped, and the crown finally adjusted with wood or metal pivot. In cases where a thin tooth was required on account of the peculiar occlusion of the antagonizing teeth, a gold cap was fitted over the root, a pivot soldered to this, and a palate tooth attached to the cap and then inserted in the same manner as described for bridge-work. However, before these were known, more than twenty-five years ago, he inserted his first artificial crown on a plurality of roots. The roots of the first right superior bicuspid were drilled and shaped for base of crown, then a gold cap, as described above, was properly fitted, into this two metal pivots, corresponding exactly to the position of the two root-canals, and then a bicuspid plate tooth was backed and soldered to the cap, and finally adjusted in the usual way. He knew this case to have lasted more than twenty years, when I lost sight of the patient.

HEALTH IN THE OFFICE.

By H. B. NOBLE, D.D.S., Washington, D.C.

PURE, fresh air is of prime importance to health, yet how little value seems to be attached to it, if we may judge from the close unhealthy atmosphere of our dental operating-rooms, charged with the concentrated emanations from iodoform, creosote, and half a dozen more ill-smelling compounds, and mixed with the perfumes of dead pulps and foul teeth. Though the operator may exist in these improper surroundings for a long time, nature, finally rebels, and protests in the form of headaches, backaches, weakened eyes, and the like. To secure a healthy office we must have good light and good ventilation. In regard to light, north, south, and east each has its advantages and disadvantages. The north is a clear, steady light, but is not strong; and in the short winter months and cloudy weather its defects are clearly seen and felt. The east is a good morning light, but is weakest in the closing hours of the day, just when one is tired and wants the best light possible. A south light is the strongest and longest, and if properly regulated by white curtains in the middle of the day, the best. A west light should never be chosen if either of the others can be had, as it will be weak in the morning and bad in the afternoon. The dental operating-room should not be a small one, or a box partitioned off from an ordinary room, without apparent thought of air or ventilation. On the contrary, the operating-room should be of good size and separate from the parlour, or ante-room. The laboratory should be a commodious, light, sunny room, not the little back pantry-closet or dark, damp cellar often seen. Sun and air must be had if either good health or good work is expected. Then have all medicines in glass-stoppered bottles, in a case, so as to keep the office as free as possible from disagreeable odours. It is not at all necessary to have one's office, instruments, or person so saturated with creosote and iodoform as to advertise one's calling. This is neither gentlemanly nor agreeable. No professional man is so likely to neglect proper exercise as the dentist, with his tired back calling him to the lounge or easy chair; but air and exercise must be had, either by riding, driving, or walking. To this end it is well to have the office separate from the dwelling.

Manipulative Miscellany.

All new instruments or articles wished to be described under this heading are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

USES OF THE PROTECTED SURGICAL ELECTRIC LAMP.

By N. STEVENSON, M.R.C.S., L.D.S.

THE lamp was made expressly by the Swan Electric Light Company. It was fitted into an ivory socket firmly screwed to a metal tube like a No. 8 catheter, and covered with a glass shade, so as to allow sufficient air space, to prevent contact at any point between the two. The tube passed through a suitable wooden handle, and being open at each end, allowed the air to circulate freely. Now, that better lamps can be easily obtained and that the batteries are immensely superior to the old ones, the lamps are re-introduced and their use is extended.

I find this lamp useful for any kind of examination where light is required without undue heat. It may be used in contact with any part of the body, if it is not kept lighted too long; for this reason I prefer to let the patient control it if possible, for then it can be lit at pleasure, and confidence is established. It is valuable in most operations of dental surgery, but especially so in preparing difficult cavities for fillings, or for working out nerve canals and in detecting exposure of the pulp. In cases of closure of the jaws from spasm or other cause, it gives enough light through a gap in the teeth to enable one to see perfectly the whole cavity of the mouth. It may be put into one nostril to examine the other by lighting it up through the septum. It is useful also (with a slight alteration in the bend of the stem) for gynaecology, and in abdominal surgery specially valuable.

In another application chiefly useful for scaling long teeth sloping inwards, the lamp is fixed by the air tube to a flat silver ring, which is surrounded with gutta-percha, so that it may be conveniently held in position by passing the forefinger through it. Whilst the lamp lights the whole floor of the

mouth, it also keeps the tongue out of the way, and the ring prevents the mouth from closing and protects the finger from the teeth.

I fitted another into the tongue plate of Mr. Smith's gag for cleft palate operations ; with this the surgeon gets a perfect light, and is relieved from the nuisance of having constantly to dodge his own shadows . The necessary air tube here is carried in a groove in one side of the lower limb of the gag, and emerges into the open air near the hinge. The operator regulates both these instruments by pressing with his foot or knee a specially arranged switch for the purpose. If a constant light is wanted for a long operation, air would have to be forced through one tube and out at another by means of a similar arrangement to that used for diffusing spray.

Dr. Felix Semon suggested that I should try the experiment first employed by the late Professor Heryng to diagnose empyema of the antrum. He used a five-volt lamp fixed to a tongue depressor, and in a perfectly dark room, lighted the bones of the face from the mouth. I have repeated this with two five-volt protected lamps on one stem, and have further modified it by introducing them into the nostrils. The bright red in the facial cavities and the lurid glare of the soft tissues gives the face a ghastly aspect, the practical value of which is that if either antrum is diseased or filled with pus, it will be less luminous than the other, and the abnormal condition will be detected. Of course, a naked lamp cannot be used in the nostrils, as the heat would be unbearable.

I cannot estimate the practical value to others of these instruments, but I think many will find them of great service. I have myself made or mounted all those I have referred to, and if anyone wishes to do the same, I may mention that the lamps are from the Edison and Swan Electric Light Company, and are called five-volt pencil-shaped micros. In mounting the most important points are to have the lamps without other attachment than the conducting wires, and to hermetically seal the glass cover to the socket. Those who do not care to make them can obtain them with the batteries from Mr. Schall, Wigmore Street. The carbons are so delicate that the instruments must be handled with great care ; a drop of three inches on anything hard will probably break them. I always try to place them gently on something soft, like blotting paper or velvet.

Reports of Societies.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

THE Second Ordinary Meeting of the Session 1889-90, was held in the Rooms of the Society, 5, Lauriston Lane, on Thursday, the 12th December—the President, Mr. J. Austen Biggs, L.D.S., in the chair.

At the conclusion of the formal business, the following gentlemen were balloted for and admitted Members of the Society :—

Herbert Bycroft Ezard, L.D.S., Ed., 32, Buccleuch Place, Edinburgh.

Frederick Page, L.D.S., Ed., 6, Hope Street, Edinburgh.

John Turner, L.D.S., Ed., 60, Lauriston Place, Edinburgh.

John Girdwood, L.D.S., Ed., Patriothall House, Hamilton Place, Edinburgh.

Gordon Reid Sciach, L.D.S., Ed., 1, N. Guildry Street, Elgin.

David Monroe, L.D.S., Ed., 3, Howe Street, Edinburgh.

James Leslie Fraser, L.D.S., Ed., 5, Castle Street, Inverness.

John Stewart, L.D.S., Ed., 65, Queen Street, Edinburgh.

John Crostwhaite Macnamara, L.D.S., Ed., 1, Rankeillor Street, Edinburgh.

Mr. Macleod gives notice that at next Annual Meeting he will move that Law II., defining the qualification of Membership, be altered.

The Law as it at present stands reads thus :—

The Society shall consist of Ordinary, Honorary, and Corresponding Members.

The Ordinary Members shall consist of Gentlemen practising as Dentists in Great Britain, and of Medical or Surgical Practitioners interested in Dental Surgery.

The Honorary and Corresponding Members shall consist of gentlemen practising Dentistry in Great Britain, in the Colonies, or in Foreign countries, and of retired Dental Practitioners in Britain, as well as such Medical or generally Scientific Men as may have distinguished themselves in connection with Dental Surgery.

The Ordinary Members shall have vested in them the government of the Society, and all cases not otherwise specified shall be decided by them, by a majority of votes, by ballot, if required.

Mr. Macleod will move that it shall in future read :—

II. ORDINARY, HONORARY AND CORRESPONDING MEMBERS.

The Society shall consist of Ordinary, Honorary, and Corresponding Members.

a. Ordinary Members.—Gentlemen shall be eligible for Ordinary Membership who hold the Licentiate in Dental Surgery of the Licensing Bodies of Great Britain or Ireland, or a Colonial or Foreign qualification recognised by the General Medical Council entitling them to practise Dentistry in Great Britain.

b. Honorary Members.—Gentlemen [practising or retired] who hold a qualification recognised by the General Medical Council, or Foreign or Colonial Dentists holding a qualification recognised in their own country, who may have distinguished themselves in the practice of, or in connection with Dentistry, and Medical or Scientific Men who may have distinguished themselves in connection with Dentistry shall be eligible as Honorary Members.

c. Corresponding Members.—Gentlemen resident in the Colonies or Foreign Countries holding qualifications recognised in their respective countries shall be eligible as Corresponding Members.

The Ordinary Members shall have vested in them the government of the Society, and all cases not otherwise specified shall be decided by them, by a majority of votes, by ballot, if required.

The Secretary said, Mr. H. H. Edwards, whose name we are rapidly learning to associate with the question of the Missing Incisors in Man, has again sent to us drawings of models he has taken, illustrative of the subject. It will be remembered that, four years ago, he sent us a valuable communication on this topic, with nine pen and ink sketches, which were reproduced in the Society's Transactions. Mr. Edwards, in some recent correspondence, says :—

That, as far as his field for investigation is concerned, he much regrets that he is principally engaged in a family practice, and is unassociated with any hospitals, and that therefore his opportunities of observation are necessarily limited, but those that occur he does not pass by—examines every tooth he removes, to see if there is anything abnormal to be detected, and, where possible, taking impressions of a mouth which shows any peculiarities. In his practice he saw mainly the same people year after year, the children presenting the same characteristics as their parents or grandparents ; and it

was that gave him the idea he expressed, four years ago, of the theory of inheritance as evidenced in those organs over which we have the special care. It would take years to produce a basis on which to found even a theory; therefore, in the meantime, it behoves us all to contribute authenticated drawings or models of those cases that come directly under our notice. One swallow does not constitute a summer; but if we could produce thousands of swallows, we should, at all events, be entitled to a consideration. Therefore he would again urge upon his fellow-members to exert themselves, and, in the words of the title-page of a well-known journal, "Observe, compare, reflect, record." It is to our seniors to whom we would especially look for enlightenment, who, having made a competency—with time at their disposal, and with minds ripened by long experience—are better fitted to pass an opinion on the pabulum with which we younger men should make every effort to supply them.

Mr. Edwards is becoming rather of the opinion that the supernumerary tooth is a freak of nature; but respecting the lateral incisors, he sees but little to doubt in the theory that they are becoming suppressed, and that if nothing were put on record on the subject, future generations might fall into the error that we possessed no lateral incisors at all, or that in the case of a supernumerary tooth presenting itself, its original position might be argued to all eternity.

Fig. 10. Male, adult. Common phase of suppression of upper lateral incisors, centrals slightly spaced.

Fig. 11. Female, adult. Upper jaw. A redundant right lateral situated within the arch, behind, and similar in shape and size to the normal tooth.

Fig. 12. Male adult. Model of upper jaw. Centrals much spaced; right canine next to central; temporary canine still standing, and supernumerary tooth between it and left central.

Fig. 13. Male, adult.—Upper jaw. Canines next to centrals, and slightly overlapping them, and on the left side a supernumerary or dwarfed lateral, and also the root of the left temporary canine still remaining.

Fig. 14. Male, adult.—This is perhaps the most interesting of the number. It is the model of an upper jaw, with two supernumerary molars in place, behind the third molars or rather behind the roots of them, as the crowns have been, lost by decay. The left lateral is suppressed.

The suggestion that naturally presents itself is, were the teeth not removed, either in mistake for temporary teeth (in

the lower jaw) or, in either case, for purposes of regulating on the score of crowding? Mr. Edwards thinks this is not the case, the patient assuring him that no teeth had been removed from either of these positions indicated, and if the latter hypothesis were correct, their removal was very ill advised, as the teeth are leaning in too much, and additional teeth would rather have been required to have kept their inclination at the normal angle, and the gentleman in question had been under the hands of their predecessor and ante-predecessor (carrying him back some thirty years), and he is not inclined to believe they would have accorded him such mistaken treatment.

Mr. Walker (Dundee) exhibited a cap which he had constructed to fit over the exhalation valve of the "gas" face-piece, constructed somewhat on the principle of the ventilation shafts with reversible heads, which usually form a very prominent feature on the deck of a steamer, the object aimed at being to direct the respiratory exhalations away from the face of the operator. Mr. Walker said :—

"Allowing that the face-pieces supplied to us by the depots are wonderfully perfect, as far as the safety of our patients is concerned, he would venture to think they were not so as regards the operator, on account of the present open shield on the expiration valve.

The exhaled air and gas is often expelled with unusual force in the face of the operator, and there is no way of avoiding this extreme danger except by getting into rhythmical breathing with the patient. He would say extreme danger advisedly, because of the possible risks encountered with patients in the first stages of phthisis ; but leaving these out of the question, he would condemn the open shield on the minor principle of the escape of fetid breath and oral gases, especially where there had been much previous inflammation. The operator, very watchful of facial symptoms and respiratory surroundings, is too often forgetful of this, and, in bending over the patient, is often quite close to the exhalation valve, thus presenting, to our minds, a picture far from pleasant, even in contemplation.

With the aim of avoiding such danger, he exhibited a safety or melioration cap, composed of a "byssel" or ferrule, to fit the existing valve-chamber, with $\frac{1}{8}$ inch outside flange, to form an enlarged cylinder chamber $\frac{1}{4}$ inch in height. The dish rises only to touch upon two stop pegs, fixed on to the bottom of the cylinder cover, which equalises the air passage leading

to a right-angle funnel, made to revolve so that germs of disease may pass into the room, and not be expelled directly into the face of the operator. The face piece had also a small chain and catch attached, by which it was secured to a light bracket arm, similar to that used with the water-motor engine, and could thus be rapidly swung out of the way when sufficient gas had been administered to the patient."

Mr. J. Graham Munro exhibited a very ingenious binder for lathe bands. It consisted of a spiral steel spring of about 2 inches in length, with a bore sufficiently large to admit the ends of the "gut." The free ends of the wire were bent up, so that after the band was admitted the wire, on being pressed down, passed diametrically across the opening through the centre of the cord, firmly securing it in position.

Mr. Munro also exhibited a model of the lower jaw of a youth of 16. Two of the incisors were missing, and a temporary incisor still retained. The boy had never had any of his lower incisors extracted, and his grandmother had the same teeth missing, and had also retained the temporary tooth.

STUDENTS' SOCIETY OF THE LONDON DENTAL HOSPITAL.

TREASURER'S REPORT.

Mr. President and Gentlemen,

It is with considerable pleasure I present to you the Annual Report as to the financial condition of our Society, for the balance in hand shews an increase on that of last year.

There has been a decrease in the number of subscriptions owing mainly, I think, to the fact that the new members were only balloted for at the December meeting, many consequently not having as yet paid their subscriptions.

The total amount received from all sources amounts to £23 9s. 0d; the total expenses being £21 15s. 1½d., thus leaving a balance on the year's working of £1 13s. 11d.

This year's expenditure being somewhat less than that of last year, the balance in the hands of the Treasurer is increased from £21 3s. 0½d. to £22 16s. 11d.

Review.

Messrs. Ash & Sons, Limited, send us "The Illustrated Catalogue of Mineral Teeth" they have just issued. We congratulate them on its general "get up," and on the energy shown in its production. The engravings and printing are well done, whilst the care spent in its editing is clearly shown by the list of "errata" discovered and carefully printed on a fly-leaf. This sounds almost paradoxical, but such errors are almost unavoidable in the first edition of a work of this kind, and it certainly is to Messrs. Ash & Son's credit, that they have corrected them. Experience alone can prove its use to the Profession, but aided by the "set of shades" which the firm also issues, we imagine it will be of great value to those who, living in the country, are unable to visit the Depots and make a personal selection. The chief point that strikes us is the system of classification which Messrs. Ash have for their teeth. One thing, however, we note, that no provision seems to be made for the teeth of old persons.

Dental News.

LIVERPOOL DENTAL HOSPITAL.

The annual meeting of the supporters of this institution was held at the Town-hall in January, his Worship the Mayor (Mr. T. Hughes) presiding. The 29th annual report stated that the number of patients admitted since the formation of the hospital was 246,652, and during the past year the number of patients treated at the head hospital and the northern branch was 25,836, including 11,630 children, and of operations 34,868. The patients' voluntary contributions amounted to £99 19s. 4d., being a slight falling off on the previous year's. The mortgage on the premises in Mount-pleasant remained at £450, and the balance due to the treasurer was £45 13s. 6d. The Mayor, in moving the adoption of the report and financial statement, congratulated the committee upon the increased work which they had been able to perform during the year, but while complimenting the committee upon the increased operations and usefulness of

their institution he could not help regretting that there had been a slight falling off in the amount of the voluntary contributions. In the report the fact was referred to that unless some means were adopted for increasing the revenue of the institution its work would be curtailed. Looking to the class of people generally who resorted to an institution of this sort £100 was not an adequate acknowledgment on their part for the work that was done for them. The question occurred to his mind whether the committee ought not to make some little increased charge for the great benefits conferred upon them. Dr. Dawson seconded the motion, which was carried. The thanks of the meeting were accorded to the president and other officers, and also to the consulting physician and surgeon and the dental staff for their services during the past year. The officers for the ensuing twelve months having been elected an alteration was made in the rule bearing upon the entrance fees, which were slightly increased.

EDINBURGH DENTAL HOSPITAL.

The annual meeting of directors and contributors to the Edinburgh Dental Hospital was held Jan. 30th, at 5 Lauriston Lane,—Dr. John Smith in the chair. The honorary secretary (Mr. Lindsay Mackersy, W.S.) read the annual report, which stated that during the ten months of occupancy of the new premises at Lauriston Lane the staff had found their facilities for work much improved. The change had altogether been for the advancement of the hospital and for the public interest. The record of last year's work was a very gratifying one, and showed a gradual and increasing area of usefulness, the number of patients being 8385 as against 8142 in 1888, showing an increase of 242. The committee hoped that as the poorer classes became aware of the preservative resources of the institution and of the great comfort following regular and periodic attention to the teeth, every advantage would be taken of the stopping department, and that patients would not wait till toothache drove them to the dentist, when the teeth were beyond preservation. The total number of stoppings during the year was 2186; ordinary extractions, 5844; patients under anæsthetics, 306; and mechanical apparatus, 49, making the total number of patients treated in the hospital 8385. The treasurer (Mr. W. Bowman Macleod, L.D.S.) reported that the charge for the past year amounted to £900 4s. 6d. including a balance from the previous year's account of £530

1s. 5d. The year's expenditure amounted to £565 15s. 3d, leaving a balance in hand of £334 9s. 3d. There had been a marked increase in income from hospital fees, which was a guarantee to the directors and the public that the teaching and practice afforded in connection with the hospital was of a sound, thorough, and instructive character. The report was adopted. Mr. James S. Trainer, treasurer and clerk to the Royal Infirmary, said that the connection between the Dental Hospital and the Royal Infirmary was giving very great satisfaction to the medical and surgical staff of the latter institution, and was a source of great usefulness to the patients and students. No doubt as time went on the advantages to be reaped from the connection would be greatly increased. Mr. Macleod resigned the office of treasurer, which he had held for ten years, and Mr. Thomas Wallace, actuary, was appointed in his stead.

VICTORIA DENTAL HOSPITAL.

At the Dinner of the students of the Victoria Dental Hospital, Mr. H. Planck, President, in the Chair, Mr. W. Headridge proposed "The Owens College." The College, he said, was an institution doing noble work. The men associated with it had made their mark in various walks of life, and he looked forward to the men from that College attaining a still higher standard in the future. He believed the teaching staff at the College would in time be second to none in Europe. He trusted that every student of that institution would prove an ornament to it as he got on in life, for it was on the students that the honour of the institution was dependent, and he believed that if they played their parts well the institution would grow and increase by the mark which they left. He was sorry that some few members were gradually leaving the institution. Professor Roscoe had taken another path in life, and now they were about to lose the Principal, a very eminent and a very thoughtful man, who had spent the greater part of his life working for the benefit of that institution. When he (Mr. Headridge) saw the College now, and thought of what it was at one time, he felt that they had made a marvellous step in advance, and he hoped the wealth of this part of Lancashire would still be employed to help the institution forward. (Applause.)

Professor Young, in responding, said that during the time he had been connected with Owens College, and particularly as Dean of the Medical School, he had been thrown into intimate contact with Principal Greenwood, and no one knew more than he did how deeply the Principal was interested in the success of the Medical Department, and in the success of the Dental School as an integral part of that department. On every occasion when the Principal had had an opportunity of furthering the interest of the Medical School, of considering its policy and of guiding its destinies, he had done so in the most courteous, the wisest, and the most admirable way possible, and the department had gained by Principal Greenwood's connection with the College. Since they last met the sanguine expectations they then cherished had been considerably exceeded, and that result had been mainly if not entirely owing to the self-sacrificing enthusiasm and the energy of those who had been directly associated with the teaching of dental subjects. The number of students attending the Dental school had made an enormous stride onwards during the past year, in fact it had absolutely doubled. The Dental department had gained for itself a very firm footing in the Owens College, and it depended upon the students more than upon anybody else whether the Owens College Dental department was to be the success it now promised to be, owing to the efforts of those who were more particularly associated with Dental education and the Victoria Dental Hospital. He would like to see an enthusiasm similar to that exhibited by the teachers manifested by the students. It was suggested two years ago that the Victoria University should establish some qualification for dentists, but he still thought that before any such step was taken the Dental School should manifest very unmistakeable and distinct evidences of inherent vitality. As soon as they were able to show that they did possess that vitality, that there was every prospect of its continuance, that they had an increasing body of enthusiastic students, and that they had a fully equipped and well-established educational organisation, then, he thought they could go to the University and ask them to establish a special qualification in order to stamp and complete the education which was received in this particular district.

Dr. Parsons Shaw proposed "The Medical Profession," and expressed the hope that in the future the members of the dental and medical profession would be more closely united than had hitherto been the case.

Dr. Prince Stallard, who responded, said he hoped the time would soon come when all dental surgeons would not be members of a branch of the medical profession, but would be entirely united with it, and would be just as much specialists in that profession as were the specialists for the eye, the ear, and for diseases of women. He had no hesitation in saying, with regard to the Dental School itself, that in another five or ten years the Dental School of Manchester would be the Dental School of the North of England, incorporated with Owens College, and would be a source of pride to the city.

Mr. G. Ream next gave "The Staff of the Victoria Dental Hospital," remarking that upon that staff they had men who for eminence in their profession could not be excelled in any other place in the country.

Mr. T. Tanner, in acknowledging the toast, said it was a source of great gratification to the staff to see the Hospital in such a flourishing state. At the same time, he hoped they would not judge of the success of the Manchester School of Dental Surgery altogether by the number of its students or from a financial point of view. They should judge it rather from the class of students it attracted and the class of practitioners it turned out.

The other toasts were "The Dental Students," "The Guests and Visitors," and "The President."

DENTAL HOSPITAL, BIRMINGHAM.

The annual meeting of the Dental Hospital, Birmingham, was held at the Council House; the Mayor in the chair.—The Hon. Secretary read the report of the committee which stated that the number of cases treated and nature of the work performed during the fourteen months, ended September 30, 1889, were as follows:—Number of patients treated, 6,781; for extractions, 5,102; and for fillings, gold 167, other 1,483; miscellaneous and advice, 1,302; anæsthetics cases 530. These numbers represented an amount of suffering relieved or permanently cured that was almost incredible. The structural alterations to the various operating-rooms, the necessity for which the committee referred to in their last report, had been carried out, and from the greater convenience and increased facilities for special operations which had resulted therefrom it was evident that the expenditure was judicious. The expenditure for the fourteen months had been

£378 8s. 1d., while the income (including special and very exceptional donations, £159 15s. 11d.) had been £503 18s. 3d. Still, there were outstanding liabilities which would almost wholly absorb the small balance in hand. The donations for the year were thankfully acknowledged, and included the sum of £59. 11s. 11d. from the Hospital Sunday Fund, £39 17s. from the Hospital Saturday Committee, £32. 14s. 6d. from the dramatic performance by members of the Mason College Union, and £25 from the Charity Sports Committee. But the committee did not anticipate receiving anything like that amount during the next twelve months, so that they would have to depend chiefly upon the registration fees and subscriptions. The subscription list at present stood at £90. 4s. only—an amount totally inadequate for the bare necessities of the hospital, and altogether out of proportion to the useful work it was doing in the city. The committee recorded their appreciation of the services of the hospital staff, and, in conclusion, made an earnest appeal to their fellow-citizens for more funds to enable them to carry on and extend their work. The Surgical Committee report that the statistics of the past twelve months showed, as was anticipated, a considerable diminution in the number of patients attending the hospital, especially in the number of teeth extracted; and, also, at the same time, there was a highly satisfactory increase in the amount of conservative work done for the patients. The first result was due, doubtless, principally to the influence of the registration fee upon that large section of the poor who only thought of their teeth when they ached, and then only with the desire to lose the pain and the tooth together. But the second result was very gratifying, showing as it did that the section of the poor who valued their teeth, and desired to preserve them, attended the hospital in larger numbers each succeeding year.

✓ The Mayor, in moving the adoption of the report and statement of accounts, congratulated the hospital on being in a very satisfactory condition. In common with all hospitals, it wanted more funds. However, he noticed that, whereas there was a balance to the bad of £22 at the beginning of the year, at the end of the twelve months there was £120 to the good. Certainly against that there were outstanding liabilities to the extent of £80. He hoped the material improvement of the past year would be continued. At the present time hospital administration was receiving considerable attention. He did not know how far the Dental Hospital was affected, but he supposed if there was a reform wanted in hospital ad-

ministration the Dental Hospital was one of the sinners. He did not wish to prejudge the question, but it was of very great importance to all classes of society that hospitals should be administered so that those whom they were originally intended to benefit should receive the benefits intended.

ACTION BY A DENTIST.—Wood v Faubell.

The plaintiff, Mr. W. R. Wood, a dentist, of 53, Norfolk Square, Brighton, sued the Rev. F. Faubell, of Wakefield House, Henfield, for £15 15s. for teeth supplied to the defendant's wife.

Mr. Haycraft, instructed by Mr. Trevor Pollard appeared for the plaintiff, and Mr. J. K. Nye for the defendant.

The plaintiff stated that at the end of June Mrs. Faubell came to him with a lady friend and asked him what the cost of filling her mouth with teeth would be. He told her, and later on he took a model and the cases were duly made and fitted. The lady appeared satisfied with the teeth. When the lady first came he fancied he might have told her off-hand that she required fifteen teeth. The teeth were taken away on the 12th of July, and on the 23rd she returned, said the teeth did not fit, and that he had put in 13 teeth instead of 15. She did not stipulate for any special number of teeth, and when making cases of teeth like those it was not usual to do so. When she called on the 23rd he left the surgery to fetch the models from the workroom, and on his return in about a minute the lady had gone and had left the teeth behind. Frequently cases would not adjust themselves comfortably for the mouth immediately they were put in, but the close fitting was only a question of a very short time. The plates were fixed by suction and it required the patient's assistance for a time to ensure this. After the lady left the teeth behind on the 23rd, he sent them to her by post and she sent them back again.

Cross-examined : He would swear he was not angry when Mrs. Faubell came to him on the 23rd, and did not refuse to have anything more to do with the teeth. He simply told her he would fetch the models and show her, but she had gone before he returned to the surgery. He did not believe she came back on the 12th of July two or three hours after she took the teeth away in her mouth, and stated that she could not wear them, as they pained her so much. He did

not remember more than one interview that day. When the lady returned on the 23rd she gave him no opportunity of seeing what alterations were required. Had she done this there would have been no difficulty in making them fit. After the action was brought Mrs. Faubell called on him with a friend, and an enquiry was then made if he would construct another set of teeth for her. He refused to do this until he had had an opportunity of making the first set fit. The day before the case was set down for hearing she again called and asked if he would alter them. At that time, he of course refused to touch them again.

Mr. Crooksey, surgical dentist, of Worthing, now fitted the cases of teeth in the mouth of Mrs. Faubell, in the robing-room at the Court, and on being sworn stated that he had no reason to doubt the models were truly made, and the cases fitted them exactly. The cases did not fit now, as it was plain that the mouth had altered. A stump had dropped, and this would prevent the proper suction. He had no doubt that the teeth when supplied fitted exactly.

Mr. Wood, recalled, said there were now 17 teeth in the cases, he having added two after Mrs. Faubell complained that the number was short. He denied that he was in a temper when the lady brought the teeth back. This completed the case for the plaintiff.

Mrs. Faubell, on being sworn, stated that in July last she was anxious to have a set of teeth as she suffered much from indigestion. He said that the lowest sum he could do a set of teeth to fill the gaps with would be £15 15s. She had the models taken, and on July 12th she had the cases placed in her mouth, and she went away to have some refreshments, but she found they hurt her so much that she came back and had them refitted. Mr. Wood made a few slight alterations, and pushing the cases in her mouth said they now fitted so well that she could go to India with them. She wore them for some days after, but they hurt her so much that she could not eat, and her health was affected. They also kept falling whenever she opened her mouth. She called again on the 23rd and told plaintiff how badly they fitted, and asked that the defects might be remedied, and he then told her that it all came of not having ready money, and that he would have nothing more to do with them. He then left the room, and as he did not come back immediately, she left the room leaving the teeth there. Mr. Wood returned the teeth to her on the 14th September, and on the 10th she wrote to

Mr. Wood, saying that in consequence of his behaviour at the last interview she did not think that he was going to do anything more with the teeth, and returned them.

Cross-examined : She thought fifteen guineas was rather high, but Mr. Wood would not supply the teeth for less. She wore the cases for so long that they made the muscles of her mouth quite sore and tender. When she called on July 23rd she was desirous of having the teeth properly fitted, but Mr. Wood acted in such a repulsive manner that she did not care to call again. Acting under the advice of Mrs. Charlesly, she went to plaintiff and asked him for both their sakes to alter the cases and settle the matter before it came before the Court.

His honour said he could not reconcile the statements about the interview of July 23rd, but he would say no more about it but give a verdict for plaintiff with costs.

APPOINTMENTS.

Mr. James Francis Rymer, L.D.S., Eng., and M.R.C.S., of Maidstone, has been appointed Honorary Dental Surgeon to the West Kent General Hospital.

The Committee of the City of London and East London Dispensary, 35, Wilson St., Finsbury, E.C., have appointed Mr. R. Gleave Hulme, L.D.S.I., of 4, Finsbury Square, as Dental Surgeon, *vice* J. W. Elliott, Esq., M.R.C.S., L.D.S., resigned.

Mr. Arthur Turner, L.D.S., Ed., (formerly of the Dental Department of Guy's Hospital) to be Honorary Dental Surgeon to the Buckinghamshire General Infirmary.

VACANCIES.

National Dental Hospital, 149, Great Portland Street, W. The post of House Surgeon is vacant. Apply to the Secretary on or before the 25th inst.

National Dental Hospital, 149, Great Portland Street, W. The post of Assistant Dental Surgeon is vacant. Apply to the Secretary on or before the 25th inst.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

THE DEATH FROM NITROUS OXIDE.

To the Editor of the British Journal of Dental Science.

SIR,—My attention has been drawn to a letter in your Journal of the 15th January, in regard to the unfortunate gas accident which I had last October, I do not intend answering questions asked by anonymous correspondents, as sufficient details have already been given in all the principal Journals. This much, however, I may state,—only one dose was given, and that an ordinary one, anæsthesia being complete. Trusting there may be no more foolish and absurd stories circulated by the daily press and journals about this sad case,

I am, Your obedient Servant,

GEO. W. WATSON.

[It is satisfactory to elicit these facts about this case, and all must feel grateful to Mr. Watson for his public spirit in placing the full particulars promptly before the profession.—Ed. B. J. D. S.]

Hospital Reports.

MONTHLY STATEMENT of operations performed at the Dental Hospital of London, during January, 1890:—

Extractions	Children under 14	.	.	.	.	.	833
	Adults	.	.	.	.	.	355
	Under Gas	.	.	.	.	.	747
Gold Fillings.	.	.	.	.	.	.	307
Plastic Fillings	.	.	.	.	.	.	994
Regulation Cases.	.	.	.	.	.	.	43
Miscellaneous	.	.	.	.	.	.	360
Total							3639

T. A. GOARD,
V. KNOWLES,
J. A. MALLEY,

} *House Surgeons.*

Work done at the Victoria Dental Hospital of Manchester, during the month of December, 1889.

Number of patients attended	749
Extractions { Children under 14	438
Adults	
Under Nitrous Oxide.	79
Gold Stoppings	24
Other Stoppings	141
Miscellaneous	311
Total	993

CHARLES H. SMALE, *House Surgeon.*

Work done at the Victoria Dental Hospital of Manchester during the month of January, 1890 :—

Number of patients attended	1098
Number of Extractions	795
Number of Extractions under Anæsthetics	132
Gold Stoppings	33
Other Stoppings	180
Miscellaneous	302
Total	1442

CHARLES H. SMALE, *House Surgeon.*

ERRATUM.

Page 129, Line 6th from bottom, read "Erupted very much out of line" instead of "Emptied very much out of late."

British Journal of Dental Science.

No. 531. LONDON, MARCH 1, 1890. VOL. XXXIII.

ON NASAL OBSTRUCTION AND MOUTH BREATHING AS FACTORS IN THE ETIOLOGY OF CARIES OF THE TEETH, AND IN THE DEVELOPMENT OF THE VAULTED PALATE.*

BY SCANES SPICER, M.D., B.Sc.

IT is with very great diffidence that I, as a physician practising in laryngology and rhinology, find myself introducing for discussion at the Odontological Society of Great Britain a subject dealing especially with disorders of the teeth, for with those disorders I have no technical acquaintance; but I have been induced to bring this subject forward in the full belief that it is only by the free exchange of ideas between men practising in, and thinking on, the different branches of our profession that any real advance can be expected in our knowledge of the relations between the disorders of the different organs of the body. I feel further, that an apology is due to your Society for making this communication, while the subject is in a comparatively incomplete state, and I trust you will therefore consider the present contribution as a suggestion or as an indication of the direction in which further extended researches are required before any final and absolute conclusion can be arrived at. In the prosecution of these inquiries I most cordially invite your criticism and assistance.

At the outset of my special practice the intimate association between carious teeth on the one hand, and diseases of the pharynx and tonsils on the other, was speedily forced upon me. It then became a matter of routine with me in every case to investigate the condition of the teeth and to call in the aid of the dental surgeon as a preliminary step in the treatment of chronic pharyngeal and tonsillar disorders, if the teeth were acting as receptacles for decomposing *debris* and

* A Paper read before the Odontological Society of Great Britain.

micro-organisms ; this course was attended with the most satisfactory results.

As a consequence of a routine examination of the teeth, I was specially struck with two things ;—Firstly, the great prevalence of caries in the teeth of patients who had nasal obstruction, and were, consequently, necessarily mouth breathers ; and not only this, but the general idea was impressed on me that the amount and degree of caries bore some relation to the extent and duration of the nasal obstruction—that is to say, that patients who had been from early age the subjects of much nasal obstruction almost invariably exhibited an advanced condition of caries and loss of teeth. Secondly, the large number of my younger patients from the ages of eleven years upwards who came to me for the well-recognised symptoms of nasal obstruction, and who had at the same time palates of a highly-vaulted character, much contraction of the dental arch, and decided irregularities of the teeth—more especially outward growing and forward direction of the canines, and slight obliquity and overlapping of the incisors of the upper jaw.

In the first place, it is of course obvious that between nasal obstruction and these dental and maxillary conditions may be a mere accidental coincidence ; but I think you will find that sufficient reasons exist for, tentatively at all events, supporting the position that there is a genetic relation between them, and for collecting further observations on the questions.

At the outset let me say a few words as to why “nasal obstruction” and “mouth breathing” are joined together in the title of this paper, and I will do so by asking the question—how should we normally breathe ? To this the answer can be given without any hesitation or qualification—*invariably through the nose*. The nose is the avenue through which all the air for the lungs should pass ; and that most important functions in relation to the inspired air are performed here has been abundantly proved by the accurate thermometric and hygrometric measurements of Aschenbrandt, Kayser, Greville Macdonald, and Blocq. Briefly summarised, these experiments have shown that almost the whole of the warming, moistening and filtering of the inspired air is done in the nose and its accessory cavities, so that the cold, dry and dust-laden air is here rendered fit for contact with the delicate mucous membrane of the larynx and lower respiratory tract. The complicated projections and recesses lined with a highly vascular and erectile mucous membrane must be regarded

indeed as an elaborate mechanism to effect this purpose.

That all the higher animals, the primitive Indian tribes of America, negroes, Malays and bushmen, and practically all children at birth habitually breathe through the nose are generally recognised facts. Civilised man, only too often, at an early age (frequently with the first catarrh), commences the practice of mouth breathing.

The question naturally arises, why has civilised man taken up this habit, and to such a large extent ceased to use the organ specially suited for the purposes of preparing his respiratory food? It is because he is unable to procure, even when at rest sufficient respiratory air for the needs of the organism through the nasal passages. Consequently he has to make habitual use of the mouth—the emergency entrance for air, which should only be used under special circumstances of special stress, as during some prolonged or arduous muscular or vocal effort. Civilised man does not get enough air through the nose because there is in him very commonly more or less obstruction of the nasal channels.

On examining the nasal fossæ with a good light, a nasal speculum and a rhinoscope, and on testing the perviousness of each side of the nose separately, we shall be surprised at first to find how widely prevalent and how various the different forms of nasal obstruction are. Some, temporary, are due to turgescence or erectile tumefaction and œdema of the vascular mucous membranes, and vary from hour to hour during the day; from day to night as the vertical position is exchanged for the horizontal, and from side to side as the patient lies on his right or left side in bed. Others again are permanent, and due to catarrhal inflammation of the mucous membrane with great thickening, and formation of polypoid flaps; to true polypi; to cartilaginous and bony outgrowths from the septum of the nose; and to bent conditions of the septum. Others again are situated back in the nasopharynx. Among these I would especially mention the form so common in young people known as post nasal adenoid vegetations.

Are these obstructions of the nose far more common among civilised man than among races living in a state of nature? My opinion is that they are, and it is based on the following considerations:—

(1) Careful examinations of skulls in museums establishes the immensely greater proportion of deflections and other osseous irregularities in civilised Europeans than in non-civilised non-Europeans.

(2) Personal examination of several non-civilised non-Europeans (negroes, Red Indians, &c.), though only made on individuals temporarily in this country and on an insufficient scale to finally decide the point, has demonstrated that they have large, wide, patent nostrils, straight septums, and no obstruction, whereas a civilised European without some temporary or permanent obstruction I have hardly ever met.

(3) Non-civilised non-European races do not possess the physiognomical features which are characteristic of nasal obstruction among civilised Europeans—dropped jaw, open mouth, collapsed *alæ nasi*, &c.

(4) Mr. Catlin's observations on the primitive Indian races of America have established that they are almost universally nose breathers, and that the mothers are very careful to correct any temporary lapse into mouth-breathing on the part of their offspring. On examining the skulls of Red Indians in the Museum of the Royal College of Surgeons, the freedom from crooked septums and bony spurs was remarkable, as compared with skulls of civilised Europeans.

(5) Animals that as far as the environment go approximate to the condition of the uncivilised races of men are free from obstructions of the nose, their channels are roomy, their septa symmetrical, and they continue throughout life to breathe through the nose.

Seeing, then, that civilised man is so much more liable to nasal obstruction than his uncivilised brethren and animals, can we detect any exciting cause in his environment? My opinion is that we can, and that although the factor is a small one, it is constantly acting, and its cumulative effect in the lifetime of an individual or of a family or race is not inconsiderable. Such a cause I am inclined to see in the artificial and partial heating of our houses, and the rash way in which we expose ourselves to sudden, extreme, and frequent changes of the temperature and moisture of the air we breathe, at one moment in a hot dry room at 75°, the next in the open air at 32° F., the next in a draught, and all night perhaps sleeping in a room at 50°, after spending the day in a room of 70°. The mechanism for the warming and moistening of the air is adaptable in a certain degree to these variations, but beyond this degree not so, and disordered states ensue. In this way the nasal mucous membrane gets in a state of inferior vitality and irritable weakness, and erects, inflames and hypertrophies without further provocation, thus producing some of the numerous forms of nasal obstruction. As the exciting causes continue

to act, there is no tendency to spontaneous recovery. The secretions of the disordered mucous membrane become abnormal and irritating the lymphoid channels and follicles in the nasopharynx, and adenoid vegetations are the result.

The nose is now very blocked, little or no air can pass through it, especially if there is an exacerbation of inflammation, and should this obstruction last long during the growth of the organism, imperfect evolution of the nose will be one of the characters in the physiognomy. I do not mean to say that this is a complete explanation of all the varieties of nasal obstruction, or to overlook the fact that many diathetic and specific diseases also influence the condition of the nasal mucous membrane, as well as sources of irritation from occupation, and also injuries of the long framework.

On the other hand, in uncivilised men that dwell in freely ventilated abodes, generally not artificially warmed, or like the animals, practically in the open air, no extreme, sudden, and frequent variations in the demands made on the nasal respiratory mechanism occur. No pathological reaction therefore ensues, and the mucous membrane remains in a healthy condition, and the functions and evolution of the nose are not impaired. As there is a tendency to propagate acquired characters to the offspring, it is not difficult to conceive that whereas the Red Indian has retained a well-formed and functionally useful organ, in civilised man it is only too often stunted and obstructed.

Let us now turn from the rhinological aspect of the subject to the dental, and consider what is known as to the incidence of caries of the teeth and the occurrence of the vaulted palate in civilised and uncivilised nations, as summarised by Sir John Tomes and Mr. C. S. Tomes in their admirable "System of Dental Surgery," third edition.

I. Dr. Magitot remarks that the negro and Arab races are remarkable for the soundness of their teeth, the Caucasian for the contrary, and the Mongolians take a middle place. In the anthropological museums of Paris he found no example of caries amongst the crania of Mexicans, Peruvians, Patagonians, or natives of Australia, Madagascar, New Caledonia, nor among a collection of Malay and Javanese crania. Amongst Egyptian mummies he found a good many examples; among modern nations the inhabitants of Iceland are almost exempt.

Professor Broca observes caries far less frequent among ancient populations of Europe than at present.

Mr. Mummery concludes that the frequency of caries bears a tolerably close relation to the habits of luxury of the several peoples—which luxury, I would add, at all events in temperate climates in Europe, implies the free use of artificial warmth, with its frequent sudden and rapid changes of temperature and moisture of inspired air, and, hence catarrhs and at all events the commoner forms of nasal obstruction.

Sir John Tomes says (*loc. cit.*, p. 272) that among modern races the Esquimaux, North American Indians, Arabs, Africans, New Zealanders, Caffres and Northern Indians are distinguished for having sound teeth. My remarks on this is that these races are as a rule those which do not live in artificially heated houses, and whose skulls are remarkable for absence of bony obstructions, and most of whom continue throughout life to use nasal respiration.

Sir John Tomes adds that there appears to be no room for doubt that increased civilisation predisposes to the occurrence of caries, though as yet it is uncertain in what way it does so. He further says that caries is of very rare occurrence in animals, but when it does arise it is usually in domesticated beasts.

II. Turning next to the contracted jaw and vaulted palate and irregular teeth, Mummery (*Trans. Odont. Soc.* 1869), says that among savage races they are as rare, as destructive attrition is common; while precisely the contrary is true of civilised races; and this is generally agreed on by all authorities.

Comparing then, together these different phenomena, we find that, speaking generally, savage mode of life, comparative freedom from catarrh, nose breathing, straight nasal septums, good palate and jaws, regular teeth and freedom from caries are correlated conditions; whereas advance of civilization and luxury, artificial warming of houses, tendency to catarrh, nasal obstructions, mouth breathing, vaulted palates, contracted jaw, irregularity of teeth and tendency to caries are similarly correlated.

Since, then, it is common experience that nasal obstruction and mouth breathing precede in the life history of the individual the onset of the dental and maxillary variations, it seems legitimate to inquire if the former have any influence in the production of the latter.

As far as I know, no scientific authority has published a detailed examination of the question as to the relation between mouth breathing and disorders of the teeth; nor have I seen

any reference to the matter in the large number of papers and of text books on dental surgery, to which I have referred.

Nevertheless it has been assumed by certain writers that this is the case; *e.g.*, Catlin, a very shrewd observer, though a layman, in his suggestive and thoughtful little work entitled "Shut your Mouth," refers to the saliva flooding every part of the mouth while it is shut, and carrying off the extraneous matter which would otherwise accumulate and communicate disease to the teeth and taint to the breath; he further alludes to the teeth as immersed in protecting fluid and "with powers of existing in the open air long enough for the various purposes for which they are designed, but beyond that, abuse begins and they soon turn to decay." "It is the suppression of saliva, with dryness of the mouth, and any unnatural current of cold air across the teeth and gums during the hours of sleep, that produces malformation of the teeth, toothache and *tic douloureux*, with premature decay, and loss of teeth so lamentably prevalent in the civilized world." "Among the brute creations that never open their mouths except for taking their food and drink, their teeth are protected from the air both day and night, and seldom decay; but with man, who is a talking and laughing animal, exposing his teeth to the air a great portion of the day, and oftentimes during the whole of the night, the results are widely different—he is oftentimes toothless at forty.

(The native Indian races) "who talk little and sleep naturally, have no dentists nor dentifrice, nor do they require either; their teeth almost invariably rise from the gums and arrange themselves as regular as the keys of a piano; and without decay or aches preserve their soundness and enamel, and powers of mastication to old age. . . ."

I have quoted at some length from this writer of some thirty and forty years ago because he gives some facts and opinions which are well worthy of attention, although some of his expressions are erroneous and extravagant.

On referring again to Tomes' "Handbook of Dental Surgery," third edition, we are taught that we must seek for the agencies that cause dental caries among the chemical transformations that go on in the mouth. The decomposition of food has been proved to furnish acids capable of decalcifying enamel and dentine, and the buccal mucus has not rarely an acid reaction. Where there are many carious teeth the gums are usually swollen, vascular, and coated with thick stringy mucus, and that wherever mucus, &c., is readily and speedily

removed by the tongue or other agency, caries is very rare. Again, acute stomatitis occasionally exercises a most disastrous influence upon the teeth; and all conditions which tend to an unhealthy state of the buccal mucus membrane will have a deleterious influence. Dryness of the mouth from deficient secretion of saliva, and the accumulation of buccal mucus and epithelium is prejudicial to the teeth. Sir John Tomes concludes his remarks on caries as follows (*loc. cit.* p. 280): "That caries is an effect of external causes, in which so-called 'vital' forces play no part; that it is due to the solvent action of acids which have been generated by fermentation going on in the mouth, organisms having no small share in the matter; and when once the disintegrating process is established at some congenitally defective point, the accumulation of food and secretions in the cavities will intensify the mischief by furnishing fresh supplies of acid."

Mr. Henry Sewill, too, in his very interesting *brochure* on "Dental Caries," second edition, p. 70, says:—"The predisposing causes of caries are (1) innate structural defects in the teeth which render them more susceptible to the action of agents; (2) all such diseases as are accompanied by vitiation of the oral secretions, or which tend to the formation or deposit of acid, and the accumulation of products of decomposition within the mouth; and (3) crowding and irregularity of the teeth due to smallness and malformation of the maxillæ. The direct agents in initiating caries are acids—principally malic, butyric and acetic; the products of chemical change and fermentation set up in fragments of organic matter (food, mucus and epithelial scales), which are commonly present in the mouth and lodged about the teeth. These acids are often assisted in their action by acid mucus secreted by unhealthy gums, acid (instead of alkaline) saliva in some diseases, and acid eructated from the stomach."

(To be Concluded.)

CLASPS.—The following is a new and original method of making clasps: Take an impression (in plaster) of the tooth to be clasped; cast into this impression, Melotte's fusible alloy. A piece of clasping material, of suitable width, and long enough to encircle the tooth, with ends soldered, is driven and burnished on to the metal die till a perfect adaptation is secured. The clasp can be opened at any point desired. So says Dr. J. B. Vernon, writing in the *Archives of Dentistry*.

INAUGURAL PRESIDENTIAL ADDRESS.*

By LEONARD MATHESON, L.D.S.

GENTLEMEN,—

Little did I think, when as a Member of this Society, some fourteen years ago, I stood up with fear and trembling, to read the paper of the evening, that I should one day rise to address its members from this chair. I am very proud to occupy this position, and I beg very sincerely to thank you for the honour you have done me in electing me to be your President.

The honour is a two-fold one. In the first place, I am occupying an office which has been successively filled by men whom it is a distinction to follow; men whose names are “familiar in our mouths as household words,” because of the good work they have done, and are doing, both in connection with this Society and outside of it. In the second place, I am brought at once by my election to this chair, into a closer intimacy—than it is possible for me otherwise to enjoy—with you, gentlemen, the present active members of the Society. It is a privilege which I assure you, I value very highly—to find myself brought more closely in touch with the energetic, enquiring, progressive spirit which is so characteristic of the student mind, and which acts like a tonic and a stimulant on the mind of those, who though still looking upon themselves as students in a very real sense, have, it may be, but very little time to learn and study much else than that which is taught them in the practical school of daily experience.

And this twofold honour I appreciate none the less because the Society is now in a sound and flourishing condition. No one now thinks, or even dreams, of proposing its dissolution on account of lack of interest and support on the part of its members. It was not always so. In early days this Society had a hard struggle for existence. Originally established in the year 1863, five years after the opening of the Hospital in Soho Square, when the number of students was very small, it was vigorously supported by a small handful of men, amongst whom may be mentioned the names of Mr. Harry Harding, and Mr. Warwick Hele, the first presidents. But as the student

* Delivered before the Students' Society of the London Dental Hospital.

days of the original members came to an end, it appears that interest in the Society's doings dwindled, the new generation of students did not take up the work of their predecessors, and in 1865 the meetings ceased to take place.

Not till 1871 was the Society again set afloat. It was successfully launched under the Presidency of Mr. Samuel Cartwright, supported by a strong Council, and a goodly list of members. From that day to this, although its vigour has at times flagged, yet as the number of students attending the Hospital has increased, so the Society has also steadily grown, both in the number of its members, and in the energy and interest of its Meetings. Comparing the days when the average attendance was something under ten, with the present time when the average is, I understand, somewhere about four times that number, we may, I think, congratulate ourselves that our day finds the Society in such a prosperous condition.

Do not, however, let me be misunderstood. I would not have it thought that I gauged the value of a Society like this merely by its age and the number of its members. On the contrary, such a Society has to be on its guard, as it becomes firmly established by time and fulness of membership, against two evils. On the one hand as it acquires the dignity of age so it may also acquire the slowness and formality not seldom characteristic of that venerable period of life; it may exchange the buoyancy and eagerness of early life for the dulness and indifference of second childhood; it may grow stiff in the joints, depend too much on the staff of custom and routine, and find the ruts of use and wont better suited to its ambling pace than the rough, cross-country excursions in the fields of science and the breezy uplands of discussion and debate, that it loved so fondly in the days of its youth. On the other hand as a Society gains in standing and importance, and its roll of members is swelled by many who only join it because they understand that it is the proper thing to do, and not because of any real interest they take in its proceedings—so its proceedings, influenced by such members may tend to become trifling and childish. Whilst these two dangers are far from being imaginary ones our Society has so far been, and in the nature of things we may hope will always be, preserved from the first of them, because its individual members do not have a chance of growing old together—worse luck say some of you,—and of grinding along the groove of mere usage, until we become so fitted to it that we cannot with comfort move along any other path; whilst the second

we may hope effectually to escape by the exercise of good sense and right feeling.

Perhaps to this end I may be allowed for a moment to remind you of the objects for which the Society exists.

What meaning does our title convey? "The Students' Society." There is a story told of an old lady in some out-of-the-way country parish, who, having, or being supposed to have, an inveterate taste for literature, was for ever borrowing books from her clergyman, until at last she had read through all his library, and there was nothing left but the Dictionary. Still the old dame clamoured for more intellectual food, so in despair the Vicar lent her his Johnson, and calling upon her a few days later, was informed that the volume was a most interesting one, although the thread of the narrative was not very clear. Taking up that narrative at the word Society, I find the worthy doctor defining it as "The union of many in one general interest." We, as individuals, having many and diverse interests, find a bond of union here in one interest which is common to us all—our work.

What are the ways in which that interest is served by the meetings of this Society?

In the first place, no one can attend meetings with any regularity without making appreciable additions to the stock of knowledge, which is an important part of his stock in trade. Lectures, text books, and hospital practice teach us much, no doubt; but, all important as they are, they are not all-comprehensive, and I am sure that those of you who are best acquainted with the doings of the Society will fully bear me out when I say that in the papers and communications brought before it, and in the discussions which take place here, there is constantly to be found valuable information, which is not easily to be met with elsewhere.

But the acquisition of knowledge, important as it is, is by no means the only end that we attain. Honest interchange of thought, opinion and experience, such as we here enjoy, cannot take place without those who make the exchange, experiencing mutual stimulus and encouragement. A member relates an unusual case, and the relation brings to the mind of another a similar case, which he had almost forgotten, but which proves of the greatest interest when set by the side of the first; a difficult case described, elicits remarks, and suggestions as to diagnosis and treatment which are often times most valuable; an appliance is shown, which, for ingenuity, and fitness for its purpose stimulates invention in some other

direction ; we hear a method of practice graphically described and see models and specimens in illustration, and we are so attracted, that forthwith we adopt it as we never should have done had we not listened to a personal narration ; or a point of ethics come up for discussion, and we realise, perhaps for the first time, and if so, with some astonishment and a salutary enlargement of our mental horizon, how differently different minds judge of the same action or motive, how diverse in short, are men's views of life.

And so we give and take ; we act and re-act upon each other ; the ardent man fires his quiet neighbour, the accurate man checks the careless, the plodder shews what can be done by steady work ; and because man is an imitative and gregarious animal, we both learn from each other, and are moved by fellowship of feeling to follow a good lead, where as individuals, we might, not improbably, have remained unimpressed.

Again, as to the value of our meetings in revealing and in exercising, powers of mind and originality of thought, which might otherwise have remained unsuspected, and have slumbered on in dormant inactivity ; as to the lifelong friendships which these occasions help to strengthen, if not originate, much might be said.

Nor is this all. Besides the enlargement of our store of knowledge, besides the mental stimulus springing from the mutual contact of mind with mind, besides the quickening of our *esprit de corps* and the deepening of personal friendships, there is this further advantage in belonging to this Society, namely, that we may during our membership acquire if we will, no little experience in the art of public speaking. There are happy individuals who feel as much at home in speaking before a room full of auditors, as if they were only holding forth to a friend of their own fireside, but the average man not blest with the gift of ready speech, if he has anything to say which necessitates his getting on his feet before a number of others, experiences the most extraordinary sensations, and displays the most distressing symptoms when he makes his first attempt as an orator. His pulse goes up in the most alarming manner, his respiration becomes accelerated and irregular : his forehead, bedewed with cold perspiration, suggests a prescription containing all the most powerful sudorifics in the Pharmacopœia : and his words sticking in his throat suggest a recent study of that scene in Richard III. where Gloucester says to Buckingham :—

"Come cousin, canst thou quake, and change thy colour,
 Murder thy breath in the middle of a word,
 And then begin again, and stop again,
 As if thou wert distraught and mad with terror?"

Am I drawing a fancy picture, and laying on the colours a little thickly? All I can say is, that I know myself what it is to undergo pretty much what I have described, and, whilst entirely sympathising with any one who suffers in the same way, I would press upon them the fact, that to overcome the miserable sense of self-consciousness, and the unreasonable dread of hearing one's own voice in public, which are so difficult to control, the only way is to take such opportunities as are offered here and to force one's self to speak again and again.

There is yet another, and a very valuable purpose which these meetings serve.

We acquire here that habit of mind which is one of the distinctive marks of a professional man, I mean the readiness to communicate to others any advance in thought, any improvement in practice which it may be our good fortune to initiate or to test. Believe me he who shuts himself up to his own thoughts and ways of doing things, not only has a very dull time of it, but he fails to fulfil his duties and to enjoy his privileges as a member of a liberal profession.

By learning as we do here, to appreciate the value, of what others have to give us, and by accustoming ourselves to give in return, we prepare ourselves for taking part with interest and pleasure in the doings of other Societies and associations, with which we may throw in our lot, when our Hospital days over we find ourselves,—as many of us must do—severed by long distances from old haunts and friends. Besides the Odontological Society of Great Britain, which still holds its own as our leading scientific body, there are now similar Societies in several of the larger towns throughout the country: whilst the British Dental Association is spreading its ramifications in every direction. I have such a strong faith in the value of association in matters professional, and I have seen so much good done by it, in the way of mutual education, and in the removal of isolation and prejudice, those bars to scientific and social intercourse, that I look forward eagerly to the time when a man will consider the enrolment of his name as a Member of the B. D. A., at the very least, as a matter coming only second in importance and time, to his

acquisition of a diploma, and his registration as a qualified Dentist.

There are other points I might touch upon did time permit, and did I wish to discover the breaking strain of your patience. I might dwell upon the advantages accruing not only to the hearers but to the writers of papers, pointing out for instance how their preparation is an incentive to the careful study of the subjects dealt with, and how the writing itself is valuable practice in the expression and orderly arrangement of facts which are in one's mind, but which one cannot easily marshal in due method and sequence. I might urge upon all students of the Hospital who are not yet members the good to them and to us of their joining our ranks. I might utter a protest against the short-sightedness of those who suppose that it is the same thing to read our transactions as to take a personal part in them.

But I must bring my remarks to an end. I asked just now what we understood as the meaning of the word "Society," applied to us as dental students. I ask, as a parting shot, another question,—what is a dental student?

Is he to be described as an individual who is seeking to acquire, at the least possible amount of trouble to himself, just sufficient knowledge and skill to enable him to scrape through an examination which he looks upon as the portal leading to a satisfactory income; or is he one, who, studying to make himself a worthy member of an honourable profession, throws himself eagerly into the necessary training—who studying to render himself worthy of his patients' confidence by making *their* interests and welfare, so far as they lie in his hands, his chief aim,—works with an alert mind, a willing hand, and a conscientious determination to overcome the difficulties in his path, and finds that there is abundant interest in his work, interest which is never found by the man who merely sees in his work the means of making money.

Do we, I ask, throw ourselves with a hearty good-will into the study of those things which are to engage our time and faculties for many a year, or do we save our best energies for interests outside our work, looking upon the latter simply as a means whereby we can obtain the wherewithal to indulge in other and more congenial pursuits?

I do not presume to answer these questions. I can only say, that, in my opinion the man is to be deeply pitied who has no enthusiasm for his work. He who looks upon his daily occupation as an unpleasant thing, to be got through

and forgotten as quickly as possible, must always find it a wretched drudgery, and wearily performing it as such, he will never do it well, for the man who is indifferent to his work, can do it in no other way but indifferently. And this is certain, that so surely as any one of us makes money-getting his one object, so will he gradually become careless and slipshod in his work, until some day, something shows him with a start, how miserable his work is, as compared with that done in the days when his one thought was how to do it well. Is this cant? I believe it to be the truth.

I have occasionally heard men say,—“What chance has the honest man who conducts his practice in a professional manner, against the quackery still so rife in high as well as in low placēs, against those whose maxims and principles, or want of principles would disgrace a petty tradesman?” To such questioners I would offer two remarks. First, I would ask them to look back only a few years, and see, as they may see, what headway *has* been made against the evils we all deplore. Secondly, I would urge what I believe to be an undoubted fact, that the public *are* beginning, are more than beginning, to appreciate and understand good dentistry, and that the one, the only way, effectually and finally to stem the tide of flaunting falsehood is to show by one's own life and practice what education and honesty can do. An honourable career is and always will be, a stronger argument, even in the eyes of a gullible British public, than any act of Parliament, or any number of prosecutions. And I would further say:—Show me a man who is a good and a conscientious operator, who, along with the special knowledge acquired at the Hospitals, possesses and uses a tolerable stock of common sense and discrimination, and who is a gentleman,—by which term I mean a man who is refined and considerate, not only in manner but in feeling :—show me such a man I say, (and I do not think the demand is an extravagant one), and I will show you a man, who is certain to succeed.

You ask what do I mean by success? Do I mean an enormous income? No, I do not : conscientious, honest dentistry only under exceptional circumstances produces that. By success I mean, as much work as one can faithfully do ; a tolerable income,, enabling one to live comfortably, if not luxuriously ; and last, though by no means least, the regard and appreciation of one's patients, increasing as time goes on and the value of one's work becomes more and more apparent. I put it to you, whether such success is not worth working

and even waiting for? Or shall we prefer and choose that cheap, so-called success, which makes a miserable failure of a man's life, and which can be bought by anyone—at what cost? Only at the cost of truth and manhood :—a birthright for a mess of pottage.

Gentlemen, I will not detain you any longer. I thank you for listening to me so patiently; I thank you once more for the honour you have done me in electing me to be your President; and as I have yet done nothing to deserve it, I can only say that I shall endeavour to prove worthy of your trust by striving during my year of office, to promote, so far as in me lies, the welfare of the Students' Society of the Dental Hospital of London.

DESCRIPTION OF A SPECIMEN OF CLEFT PALATE.*

By JOHNSON SYMINGTON, M.D., F.R.S.E.,
Lecturer on Anatomy, Minto House, Edinburgh; Examiner
in Anatomy in the University of Edinburgh.

This specimen was met with in a male subject, aged seventy, dissected in my rooms last summer session. The cleft was obviously congenital, and extended through both the hard and the soft palates and the right alveolar arch. It opened above into the right nasal cavity.

The upper jaw was practically edentulous, so that it was not possible to determine the relation of the cleft to the incisor teeth. It may be noticed, however, that the cleft passed through the alveolar arch barely a quarter of an inch external to the frænum of the upper lip, so that on the right side there was obviously not room internal to the cleft for more than the central incisor tooth.

Mr. Bowman Macleod kindly made a cast of the deformity for me, and I then froze the specimen, and made a series of transverse vertical sections through the palate, nasal cavities, and maxillary sinuses. Sections of this kind are very useful for the demonstration of the relations of the palate and nasal cavities, and Zuckerkandl† has employed this method very

* Read before the Odonto-Chirurgical Society of Scotland, December 12th, 1889.

† Normale und Pathologische Anatomie der Nasenhöhle. Wien. 1882.

extensively for the illustration of diseased conditions of the nasal cavities. I have, however, been unable to find any published drawings of similar sections in cases of cleft palate. Indeed, the illustrations of this condition appear to be practically confined to representatives of the cleft as seen from the mouth. These figures, which are generally diagrammatic, merely represent what can be readily seen on an examination of the deformity in the living body, and give a very incomplete view of the condition of the palate and nasal cavities.

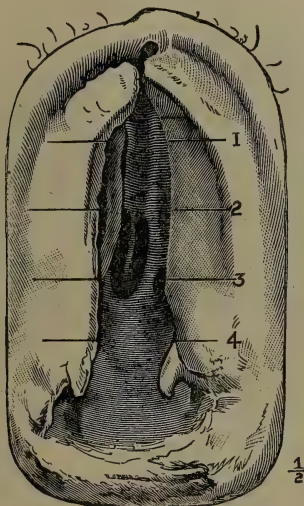


Fig. 1.

Fig. 1 is a drawing of the cleft in my specimen, as seen from the oral aspect. There is a cicatrix in the upper lip below the right nostril, and it looks as though there had been a hare-lip on that side which had been operated on. The anterior part of the alveolar arch to the left of the cleft projects lower down and overlaps somewhat the thickened and warty-like mucous membrane attached to the alveolar arch on the right side of the cleft. The left alveolar arch gradually becomes less prominent as it passes backwards. The fissure extends through both hard and soft palates and there are two distinct uvulæ.

Four transverse vertical cuts were made with a saw, so as to divide the specimen into five pieces. The two anterior cuts went through the nasal cavities, and the two posterior ones through the naso-pharynx. The transverse lines on Fig.

1, numbered 1, 2, 3, and 4, indicate the position in which the sections were made.

Fig. 2 is from a tracing of the posterior cut surface of the anterior slab. The ethmoidal sinuses and superior and middle turbinated processes are fairly symmetrical, except that the right middle turbinated process is distinctly smaller than that of the left. The septum nasi passes downwards, and slightly to the right for $1\frac{1}{4}$ inches. At this point it is thickened, and then makes a very marked bend downwards and to the left, to join the left palatine process.



Fig. 2.

It will be seen that the fissure, although opening into the right nostril, is situated to the left of the mesial plane, and the closure of the left nasal cavity is not associated with any marked development of the palatine process on that side, but depends upon the deflection of the septum nasi to the left. The vertical thickness of the left alveolar arch is decidedly greater than that of the right, but it lies farther from the mesial plane. The antrum of Highmore is larger on the left than on the right side. The openings from the antra into the infundibula are anterior to the section, and there are no apertures leading directly from the antra into the middle meatuses.

Fig. 3 shows the posterior surface of the second slab. It

will be observed that in this plane the septum has a very prominent ridge projecting from its right side into the space between the superior and middle turbinated processes. Below this ridge the septum inclines downwards and slightly to the left. The antrum extends much lower down on the left side than on the right.



Fig. 3.

Fig. 4 is taken from the posterior surface of the fourth slab. The body of the sphenoid is divided nearly half-an-inch behind the posterior clinoid processes. The left sphenoidal sinus is opened, but the right one does not extend so far back. The section is a little behind the pterygoid processes, and corresponds to the pharyngeal ends of the Eustachian tube. Each Eustachian tube is bounded internally and above by its cartilage, the outer wall being membranous. The two halves of the soft palate are of about the same thickness. Below the Eustachian orifices they are about three-quarters of an inch thick, but become rather thinner as they approach the mesial plane. This section shows extremely well the relations of the palatal muscles. The levator palati forms a well-defined mass of muscular tissues which just beneath the mucous membrane, covering the upper surface of the soft palate. The tensor palati appears

as a thin sheet of fibres lying external to the Eustachian tube. On the right side, after removing a little fat, its tendon was easily traced to the hamular process of the internal pterygoid plate. A small bundle of fibres connected internally with the lower part of the levator palati, and passing outwards and downwards, belongs to the palato-glossus. The section is immediately in front of the tonsils, and consequently anterior to the palato-pharyngeus.

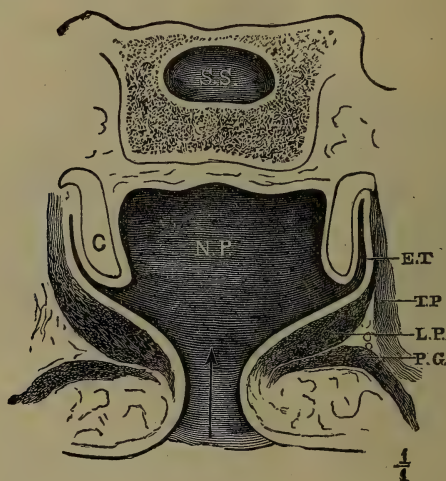


Fig. 4.

The muscles of the soft palate are separated from the mucous membrane on the oral surface of the palate, by a thick layer of glandular tissue and fat. It is scarcely necessary to point out how clearly this specimen demonstrates the relations of the muscles of the soft palate, as described by Sir William Ferguson. It also shows that the levator palati lies much nearer the upper than the lower surface of the soft palate, and, therefore, can be most readily divided by Ferguson's method.

To preserve your instruments from rusting, immerse them in a solution of carbonate of potash for a few minutes, and they will not rust for years, not even when exposed to a damp atmosphere.

British Journal of Dental Science.

LONDON, MARCH 1st, 1890.

THE CHOICE OF ANÆSTHETICS IN DENTAL SURGERY.

THE publication of a fresh investigation into the action of chloroform by Dr. Brunton and the members of the first Hyderabad Commission suggests to the minds of thoughtful dentists a reconsideration of their views about chloroform. It is still largely used in Scotland, where nitrous oxide has hardly as yet made itself thoroughly at home, and in the practice of country dentists chloroform has perforce often to be administered, since it is the only available anæsthetic. The dangers of chloroform are pretty generally accepted, and the large majority of English dentists would only employ it if nitrous oxide were unobtainable while others would prefer ether when a more prolonged anæsthesia was required than the laughing gas afforded. But ether possesses more than one disadvantage in dental work, and unless skilfully exhibited, is decidedly inconvenient, so that if chloroform could have been whitewashed many would have rejoiced. Again, the use of chloroform in succession to laughing gas, either simply or in the form of the A.C.E. mixture has been suggested and pretty extensively used, so that on all hands it was important to see the result of the second Hyderabad Commission. Before the commission it was believed that chloroform killed either (1) by a reflex inhibition of the heart conveyed through the vagus nerves ; (2) paralysis of an enfeebled heart by overdosage with chloroform ; (3) paralysis of the respiratory centre in the central nervous system. The sudden

death by heart failure was believed to occur in the very early stage of chloroforming, and was attributed to an excessively strong vapour of chloroform stimulating the terminal twigs of the vagi. The second mode of death was held to occur later, and to be due to an excessive absorption of the vapour during a prolonged period with imperfect elimination, the accumulation acted directly upon the muscular tissue of the heart itself as well as upon the centres which innervated that viscus, so that even if the elimination of the drug was rendered possible, the heart being itself poisoned, killed, so to speak—it refused further work and death resulted. In the third form of death somewhat the same occurred as in the second, only as the heart was free from disease it was not primarily attacked. A largely increased strength of vapour circulating in the blood,—and this might occur at any time through deficient elimination, or increased absorption of the vapour—would paralyse the nervous system, if indeed, it did not actually impair the irritability of the nerve cells themselves. In depressed conditions of the system, as after severe hæmorrhages, wasting diseases, etc., it was thought that as chloroform brought about a marked lowering of blood pressure, there might be a grave danger in giving that anæsthetic in such cases, lest a further dangerous, or even deadly fall of blood pressure might obtain. The Second Hyderabad Commissions, sought to traverse these conclusions, and Dr. Brunton undertook a great variety of experiments upon the lower animals, mainly dogs, and monkeys, using chloroform, ether, and A.C.E. mixture alone, and in combination with alkaloids. The experiments were found to show that in India the lower animals did not die from heart failure, at least those whose deaths were watched. Some died from accident, the nature of which the report leaves shrouded in darkness. The deaths noted were due to failure of respiration, and were preceded by a fall in blood pressure. Even after the chloroform was withdrawn this fall persisted for a time, and death was determined according as this after fall persisted a longer or a shorter time. The experiments upon ether were inconclusive, since the temperature of

Hyderabad was too high to permit proper etherisation. Various criticisms upon the conclusion of the Hyderabad Commission, among which we may note those of Messrs. Bailey, Woodhouse Braine, and Dr. Dudley Buxton, go to show that experts refuse to accept any of the Commission's conclusions as proven, and for the following reasons. (1) The lower animals, and dogs and monkeys in particular, have a very marked peculiarity as regards chloroform, being very prone to death from respiratory failure. (2) Heart failure in the lower animals is not known. (3) Clinical observation on some millions of human beings show that chloroform depresses the heart, and in many cases kills, the heart stopping before respiration. (4) The evidence of the Commission as regards the human race is wholly negative. (5) The clinical evidence showing the human heart fails under chloroform is positive. These contentions supported by the weight of such well known practical anæsthetists cannot but make us very disinclined to believe that the Commission has done more than confirm our views as to the danger of chloroform without disproving, at least as far as the human race is concerned, that heart failure certainly does ensue upon the administration of that drug and cannot in every case be avoided even by the utmost care and forethought.

THE VENETIAN FETE AT DUBLIN.—A contemporary thus describes the Bazaar and the Concert which followed it. (The Funds are to be devoted to the Dental Hospital of Ireland.) All the materials for the *fete* were of Irish manufacture, with the single exception of the artificial roses with which the Venetian masts were entwined. It was found that these could not be obtained in Ireland, and they had to be specially ordered in London. They were, however, manufactured out of Irish goods. The Duchess of Abercorn's stall had a background formed of two pictures of the Grand Canal, Venice. A bronze statue of Bacchus on this stall holds aloft a cluster of nine electric lights, which illuminate a quantity of antique plate, which form the prizes in the lottery, the drawing of which was

advertised to take place last Saturday. Each stall had for background a picture of some Venetian scenes painted by a member of the Dublin Art Club. The address presented to Lady Londonderry, on her opening the bazaar, was bound in figured Irish poplin of an old-fashioned design. Terra-cotta and old gold formed the principal colours of the decorations, and when lit up in the evening by electricity looked uncommonly well. Many of the ladies who sold at the stalls wore fancy costumes. On Tuesday, the 11th, a grand concert was held, at which the Lord-Lieutenant and Lady Zetland were present. In the evenings the fronts of the stalls were removed, so as to convert the latter into nooks where the dancers might rest or "sit out" at their ease. Liddell's band provided the music. Dublin has been pleasantly excited over the *fete*, which is expected to result in a substantial sum for the Dental Hospital.

THE OLD SILVER RAFFLE.—In connection with the Fête, there was a raffle of old silver, and the following are the winners. As will be seen the largest proportion of winners are Irish and "lay."

	BLOCK No.	NAME AND ADDRESS OF WINNER.
1st	5251	T. F. Pigot, 41, Upper Mount Street, Dublin.
2nd	8797	G. H. Boughton, West House, Compton Hill Road, London
3rd	A1162	J. H. C. Murray, Ashfield, Beau Parc, co. Meath
4th	979	B. F. Fleming, 3, Uxbridge Terrace, Dartmouth Road, Dublin
5th	606	Mrs. M. Burke, 107, Baggot Street, Dublin
6th	11692	Mrs. Townsend, Harrow House, Ballybrack, co. Dublin
7th	22544	Mrs. Cherry, 36, South Street, New Ross
8th	367	W. Geale-Wybrants, Esq., 45, Raglan Road, Dublin
9th	603	Miss F. Wingfield, 2, Eaton Square, Monkstown, co. Dublin
10th	3009	E. H. Kelly, Grosvenor Hotel, Dublin
11th	B269	Rev. R. Atkinson
12th	10492	Adam L. Blood, 6, Longford Terrace, Monkstown, co. Dublin
13th	A6039	Robert Whitehead, Greenside Lodge, Woodhouse, Milthorpe, Westmoreland
14th	8901	Mrs. J. E. Vernon, Castle Park, Kingstown, co. Dublin
15th	30085	H. Williams, 32, Ship Quay Street, Derry
16th	30405	W. H. Woodhouse, 10, Melcombe Place, Dorset Square, London, N.W.
17th	15003	A. Cane, Esq., 12, St. James' Terrace, Clonskeagh, Dublin
18th	616	T. Purcell, Esq., 71, Harcourt Street, Dublin

19th 9048 Miss Hannan, 130, Lower Baggot Street, Dublin
20th 8171 H. Verner, Esq., Churchill, Moy, co. Armagh.

PERCY R. GRACE, Bart., *Chairman.*

GEO. DRURY, *Secretary.*

Winners in the above Drawing can obtain their prizes after next Thursday, February 20th, by presenting the winning ticket to Mr. Michael Falk, 32, Grafton Street; or by sending the ticket in registered letter. In all cases, however, the prize will be sent at applicant's own risk.

VITIATION OF ORAL SECRETIONS DURING PREGNANCY.

—It is suggested that to maintain due alkalinity during pregnancy twenty grains of bi-carbonate of soda or potash should be taken a quarter of an hour after meals. How important the matter is to maintain a healthy condition of the oral secretions is not sufficiently recognised. Dr. Wardlaw thinks the influence of sex positive as a predisposing cause of caries, on account of the excessive liability in the case of pregnant females from the vitiated condition of the fluids of the mouth consequent upon systemic disorder thus having their corrosive properties increased.

THE CARE OF THE TEETH IN CHILDHOOD.—The importance of attention to the teeth of children, not only for their immediate comfort, but in view of their future benefit—an importance we have repeatedly urged,—was again emphasised in a valuable paper read by Mr. Francis Fox at a meeting of the Medical Officers of Schools Association. He said that doubtless many of the dental troubles of adult life are due to a careless disregard of the teeth when first erupted and during the earlier years of life, and that much might be done to combat deleterious influences, especially at that important epoch the time of second dentition. Caries of the deciduous teeth, the deposition of tartar, which has a particularly destructive power, forming a nidus for the growth of bacilli and leptothrix, and rapidly disintegrating the enamel, and alveolar abscess of the temporary teeth, should each be carefully

treated. A point which Mr. Fox especially insisted upon was the too frequent neglect of irregularities of the permanent teeth, which are not only disfiguring, but from the increased and continuous pressure upon contiguous teeth, and the difficulty of keeping their surfaces clean, constitute a most frequent cause of decay and early loss of teeth.

THE CHISWICK MURDER.—We had occasion to notice the medico-legal bearings which were involved in the so-called “Chiswick Murder,” and at the time of writing were not in possession of the evidence which transpired after the opening of the formal enquiry, and which put such a very different complexion on the matter. The Dean of the London Dental Hospital, has in writing to the *Times*, made the following pertinent remarks. “May I be allowed to suggest to the Treasury, through your columns, the advisability of a duly qualified dental surgeon being consulted in cases similar to this one at Chiswick? It would be well also that he should be a qualified surgeon, in order that his expert opinion might be of more weight and value. From the first evidence every dentist was aware that death was not caused by the woman’s false teeth becoming loose and getting stuck in the œsophagus, pharynx, or larynx, such an accident being impossible with a plate so large as the one worn by the victim. The public Press have very unnecessarily created a scare on this subject, and I shall be glad if you will allow me to say that—first, artificial teeth should not be worn at night, unless they fit very tightly; secondly, that all small plates should be removed at night; thirdly, that as soon as artificial teeth begin to fit badly the plate should invariably be refitted to the altered mouth. If these precautions were taken, the sad catastrophies that are from time to time reported in the Press as having been caused by artificial teeth, would not occur.”

FASHION IN TEETH AS WELL AS IN FORM.—White and evenly placed teeth appear to us the chief ornament of the mouth; but all nations have not the same opinion. To the

Siamese, black teeth are the handsomest ; it is their daily care to blacken them. In Macassar yellow and red teeth are esteemed above white or black ones. The women of Macassar spend a part of the day in painting their alternate teeth red and yellow. Among the Jaggas, the absence of the two upper incisor teeth is a condition of beauty. The women who lacks sufficient courage to have them drawn would be despised and would be unable to find a husband. Many woman, led by coquetry or a desire to please, have four front teeth drawn instead of two, and are sure to find adorers. In one country a thick neck, short and buried between the shoulders, is admired ; in another it is a long and slender neck that is most esteemed. In certain localities in the Alps an enormous goitre has its charms ; a woman without this appendage could not be married. Neither is their unanimous agreement in regard to what constitutes beauty of form. The Turks and Germans require stoutness in a woman ; the Japanese and Chinese demand thinness. The former are fond of thick and large waists. Nor have we the right to smile at the preferences of these people, for do not we, who consider ourselves past masters in point of good taste, at one time find beauty in a large waist, simulated by a girdle clasped under the arms, and at another in a wasp waist, whose ridiculous length encroaches on the hips ?

TO IMPROVE the common air syringe or chip blower, add a few inches of rubber tubing in place of the valve, transferring the valve to the free end of the tubing. With this change it may be depended upon to pull wind every time, and hold it.

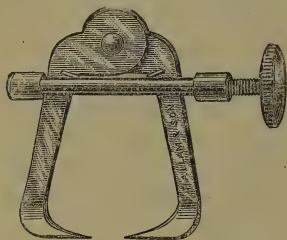
A SIMPLE and efficacious mouth wash is obtained by adding carbolic acid in crystals four drachms to three ounces each of glycerine and water, and then after carefully mixing, rubbing it on with a soft tooth brush.

Manipulative Miscellany.

All new instruments or articles wished to be described under this heading are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

A NOVEL "UNIVERSAL" SEPARATOR

Is that sent us by Messrs. Hallam & Son, of which we give a print. An American invention, it is, we believe, first made and introduced to the Profession in England by the above firm. It will be seen that it is designed on the double-wedge principle, on wedge at the back and a second at the front being simultaneously driven between the teeth to be separated, by



turning the screw. The amount of space which is so gained, is however, strictly limited, and in this sense, the instrument, is not "Universal," for, where the necks of the teeth are widely apart though the "cutting edges" may be in contact, the "limit" of the instrument is reached with but slight separation of the latter. This "limit" might be extended by making the wedges more obtuse, giving them wider bases by making the arms describe a greater curve, allowing a greater approximation of these arms by doing away with the cross bar in the slot of the bridge and, if need be, lengthening the screw. We are not sure whether, seeing how delicate is the enamel at the cervical edge, we are ever justified in forcing in a metal wedge, but certainly we must take decided objection to wedges with such sharp edges and points as those on the instrument Messrs. Hallam & Son send us, and of which we rather fail to see the advantage. The screw being provided with a milled head, is complete in itself; when using it, however, we must confess we wished the milled head absent. Would not a head like that on the screw in "Parr's Separator," be more out of the way? We may seem to have had rather a grumble at the instrument, but this is because we

regard it as so simple, so cheap so adaptable to all parts, and so little in the way of the operator, and we look upon it as so useful an adjunct in the surgery, that we wish it mended,—not ended.

LANOLINE OINTMENT, COLD CREAM AND SOAP.

Messrs. Burroughs Wellcome & Co. send us some very elegant preparations of Lanoline prepared according to the formula of Liebreick. This fatty body is now largely used in the treatment of skin affections, both as a simple ointment and as the basis of compound ointments and inunctions, it is believed with good results. Liebreick contending that it is absolutely non-irritative to the skin and more readily absorbed than other fats. The special preparations under notice are for toilet purposes, a simple "Lanoline ointment" and a "Cold cream." In our speciality they will no doubt be largely used as an application to sore lips when any lengthy dental operation is about to be undertaken; indeed, it would be well to direct the patient to use it for a few days previous to the visit. The dental surgeon will especially find the "Cold Cream" useful as an application to chapped hands, since if rubbed in after washing, but before drying, no grease is left upon the fingers. A Lanoline soap is prepared which it is hoped will prove to be absolutely free from the irritative effects appertaining to ordinary soaps.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

ANNUAL GENERAL MEETING, held January 13th, 1890,
Mr. HENRY SEWILL, M.R.C.S., L.D.S., *President*,
in the Chair.

The minutes of the preceding meeting having been read and confirmed,

The President announced that Mr. Alfred Coleman, F.R.C.S., L.D.S., had been nominated by the Council for election as an honorary member.

Mr. Alfred Coleman had, the President reminded them, virtually retired from the profession, but during the portion of his career in which he had been connected with the Society, he had been conspicuous for his energy and loyalty to its interests. He was one of its first members who had taken the fellowship in the Royal College of Surgeons of England, and had held with ability most of the offices connected with the Society.

Mr. Alfred Coleman, F.R.C.S., L.D.S., was elected an honorary member by acclamation.

Mr. Thomas G. Read and Mr. Charles Winterbottom having signed the obligation book were formally received into the Society by the President.

The Treasurer (Mr. Thomas Arnold Rogers) then presented the annual report. He stated that the financial year just completed had been more prosperous than the last, in that, an increase had occurred in their income, while a decrease was existent on the year's expenditure. This satisfactory condition, although a matter of congratulation, could not, the Treasurer feared, be regarded as permanent. Indeed, Mr. Rogers could not hold out any hope of so satisfactory a balance-sheet for coming years. The expenses arising from matters which could hardly be avoided would every year become greater in spite of the efforts of the Society's officers who had control over its various departments, and who were doing their best to keep down expenses and to enlist fresh members to assist in promoting fresh income. Dwelling upon the details of the balance-sheet, Mr. Rogers said he had endeavoured to allocate the disbursements proper to each department, so that it could more easily be estimated exactly how much expense each department entailed upon the Society.

Messrs. Harry Baldwin and W. B. Paterson were appointed Scrutineers of the ballot for the officers.

The librarian (Mr. Ashley Gibbins) then read his report as follows :—

Mr. President and Gentlemen,—Having examined the books in the Library, I am happy to state that I find them in a satisfactory condition. A few books are missing, notably Makin's "Metallurgy," Quain's "Surgical Plates," Flower's "Diagram of the Nerves," and Stricker's "Histology;" but these have been absent for a long time. The number of books which has been borrowed during the year falls somewhat short of last year, and I cannot but think that the usefulness of the Library, as a reference Library, would be much increased if

members would return the books which they borrow a little more promptly. I am led to make this remark by noticing that a number of books have been in the possession of members for several months, and I venture to remind them that the time allowed by our bye-laws is a fortnight.

Since our last meeting the following books have been added to the Library :—Tomes' "Dental Anatomy and Physiology," new edition ; Sutton on "Dermoids."

I shall be glad if members will suggest the names of any books which they think should be added to the Library, and will enter the names in the book kept on the Library table for that purpose.

Before sitting down I wish to say that the new list of members will be published with the Transactions of this meeting, and I shall be obliged if members will at once communicate to me any errors that may occur in it for rectification ; it will be arranged in a manner somewhat different to heretofore, the names of all the members being arranged alphabetically in the first part, with their addresses and qualifications, &c., and according to the town in which they practise in the second part. This arrangement will, in the opinion of the Council, be more convenient for reference.

The Curator (Mr. Storer Bennett), in delivering his report, said there was little to add to what, from time to time had been stated by him in describing specimens presented to the Museum. Fewer specimens had been added to the Museum, and somewhat fewer donations made to the collection than last year. It would be within the memory of the meeting that Dr. Talbot of Chicago, had presented some models of dental irregularities, and Mr. Storer Bennett proposed, with the Society's permission, to describe these to the present meeting.

Mr. Storer Bennett said that some months ago he had received, on behalf of the Society, from Dr. Talbot, of Chicago, seven cases of models illustrating types of abnormalities of the jaws of children. As doubtless members of the Society would be aware, Dr. Talbot classifies such irregularities in the following manner : (1) V-shaped, (2) saddle-shaped ; whilst as sub-classes he places the remaining irregularities in two categories, viz., (i.) the modified, or half V-shaped, (ii.) the modified, or half saddle-shaped. The models in the cases were arranged in exemplification of these principles of classification. A paper by Dr. Talbot, in which he explains his views, had appeared in the *Dental Cosmos* for October

1889. Dr. Talbot has also kindly presented to the Society's Library a *resumé* of his work, for reference by the members of the Society.

Mr. Storer Bennett further stated that a specimen had been presented to the Museum by the President. It was a fragment of a lower jaw found in a Roman tomb in Algeria. Some undeniably Roman poetry had been found with it, so that it would appear to be authentic. Probably it was the jaw of a highly civilised individual, possibly a Roman soldier, quartered in the African colony. Examination of the jaw showed that the left six-year old molar had been lost some considerable time before death, and the socket was completely filled up.

The President then called upon Dr. Scanes Spicer to read his paper. [See page 193.]

DISCUSSION ON DR. SPICER'S PAPER.

The President said Dr. Scanes Spicer had placed clearly before them facts and hypotheses of great interest. He had been glad Dr. Spicer had insisted, as he had done, upon the fact that the origin of caries must be looked for in extraneous circumstances rather than internal structural processes. He, the President, could not express in sufficiently strong terms that the origin of caries lay in processes entirely due to external agencies, while the tissues constituting the teeth were absolutely passive, and in this view all must agree who had any pretensions to a knowledge of dental pathology. Enamel, when once fully formed, could not by any conceivable process undergo any change, since no physiological agencies existed in enamel whereby changes could be brought about. It was a matter of extreme regret that so much that was erroneous, and so much that was unreliable, had been written and published on the origin of caries. One individual had gone so far as to say that micro-organisms were really nothing more than inflammatory corpuscles—a statement which could only prove how absolutely ignorant its propounder was alike of the science of bacteriology and that of microscopy. Many had observed the coincidence of mouth breathing with a modification of the form of the jaws, and the subject was one of great interest, and would, he trusted, elicit a good discussion.

Mr. Robert Hall Woodhouse said that they must have all listened with interest to the paper, but he felt he for one

could hardly accept all the conclusions laid down in it without further proof ; for example, he could not help thinking too much stress had been laid by the reader of the paper upon the fact that in mouth breathers, the temperature of the teeth and gums was liable to vicissitudes of temperature. As a matter of fact, he thought that the extremely full and free circulation of blood, both through the teeth, the gums, and the buccal structures, effectually counterbalanced the effect of mouth breathing, and would maintain a fairly equable temperature. And again, if Dr. Scanes Spicer's contention were just, an anomaly existed, for the exposed surfaces of the teeth, viz., their lingual aspect should become carious first, which, however, was not the case. There was another matter upon which he might touch, viz., with regard to the shape of the jaws. While admitting that mouth breathing might in some cases produce modification in the shape of the jaws, he believed a more important factor was to be found in the individual physique ; thus it was easy upon looking at any given person to say whether or no the arch were contracted for example powerfully built, broad, muscular men did not reveal a narrow dental arch. At one time he had devoted a considerable amount of time and study to the consideration of the maternal dental arch as affecting child birth, as he was sure that in parturition the presence or absence of a wide maternal jaw made all the difference between an easy and a difficult delivery. Of course that subject could not be pursued further in that Society, but he was assured of its great importance, and it was of interest in the present connection in that a wide or narrow arch at birth could have nothing to do with vicious methods of breathing, but must be a distinctly racial trait. Another point he should like to touch upon, was with reference to the carious condition of teeth in civilised peoples, who were said to be mouth breathers, in contrast to the healthy teeth of uncivilized races. He believed the apparent immunity from caries which the latter appeared to enjoy might be explained by their general better state of health, and more perfect physical development. An examination of the teeth of uncivilised peoples showed them to be, in proportion to their size, more widely separated, more massive and rounded than was the case in civilised people.

Mr. Henri Weiss believed that the presence or absence of oxygen was an important factor in the production of caries ; whatever influences an increased current of impure micro-

organism-laden air impinging upon moist teeth would predispose to the production of caries.

Mr. Storer Bennett said that Dr. Scanes Spicer had mentioned that the lower animals were nose breathers and free from dental caries. This, however, was certainly not the case in certain animals, for example, the wolf and dog, which were habitually breathing through the mouth, and were yet, except under the deleterious influences of domestication, singularly free from dental caries.

Mr. Huxley (Birmingham) said that the same idea had occurred to him, but he thought that the apparent contradiction might be reconciled. In dogs there was very profuse secretion of saliva, so that the teeth would be constantly kept flushed by that fluid, and this, coupled with the extremely active tongue, would probably counterbalance the evil effects of the constant opening of the mouth.

Dr. William Hill thought that too much importance had been attached to the changes-of-temperature theory of the disease of teeth. He had always himself been inclined to lay greater stress on the agency buccal secretions had in determining dental caries. If the atmospheric air were allowed to pass through the mouth instead of the nose, the mucous membrane lining that cavity would become unhealthy, and its secretion acid, and owing to evaporation thick and viscid, its specific gravity being distinctly higher. These changes were competent to produce caries, and were he submitted, more likely to do so than would mere vicissitudes in temperature. With regard to the shape of the arch and high vaulted palates, he believed that family and racial peculiarities largely accounted for these. He had some years ago very carefully examined a number of idiot children in Earlswood Asylum, and had found that the V-shaped maxilla was a common type among idiots.

Mr. George Cunningham thought that the paper and the discussion had brought them face to face with the fact that they were up to the present time in possession of little knowledge of the clinical aspects of dental caries. He had been very anxious to establish collective investigation upon dental diseases in children, and he hoped before long to be able to give the results of these as regards the children in State schools, &c. He thought that, with regard to caries, the British Dental Association might very well undertake to investigate the question—How far is mouth breathing in children productive of dental caries? He hoped that in the

future, when our knowledge of the chemistry of the secretions should become more exact, that we would be able to speak in a more authoritative manner upon the subject of how far vitiation of buccal secretions was pathognomonic of dental caries.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

THE Third Ordinary Meeting of the Session of 1889-90 was held in the Rooms at the Dental Hospital, Lauriston-Lane, Edinburgh, on January 9th—Mr. J. Austen Biggs, L.D.S., President, in the chair.

Mr. Macleod exhibited the dies and models which should have accompanied the reading of Mr. Pearsall's paper at last meeting. They enabled one to gauge exactly the difference between the old-fashioned die and the Pearsall die, in every respect to the advantage of the latter. Those who gave the Pearsall method a trial would discard the clumsy o'd-fashioned die for ever. The Bayley flask for die and counter die was a great advance on the old method. Pearsall's was a still further advance, but he thought a still further improvement might be made by the adaptation of the Bayley counter-flask to the Pearsall cone-die. These two methods, however, separately or combined, gave a most effective and handy swaging tool.

Mr. Stirling, in giving a demonstration on root filling with oxychloride of zinc (using for the purpose teeth out of the mouth), said that he had read a paper on this subject before the Society some four or five years ago, but it had occurred to him that if he were to show how it was done it might induce a more extensive adoption of this method of filling of roots. As far as he could learn, the filling of roots with oxychloride of zinc is practised by very few dentists in Scotland, although he thought it was otherwise in the United States; and he remembered reading, not long ago, of an American dentist who had visited this country and expressed as his opinion that we were far behind in root filling. He would recommend those who did not already make use of this method to try it. If they began with easy cases, after considerable practice he thought they would be able to fill roots which at present they might consider impossible to be filled. Mr. Stirling said he would not say anything about the treatment of roots before filling, as that had been given in the paper to which he had already referred. He then showed his

instruments for filling roots, steel bristles made of piano wire and fixed in a penholder, some of them so fine as to be able to go to the apex of the narrowest of nerve canals. He then put carbonate of soda, moistened with a drop of water, into the cavity of a tooth, and, with the bristles, forced it into the canals, working the bristle well up and down to cleanse them thoroughly, after syringing out with water. Then, to force carbolic acid in he took a small pledget of cotton wool, well saturated with the acid, put it in the cavity of decay, and, passing a bristle in by the side of the cotton into a nerve canal, worked it well up and down each one to pump up the carbolic acid. A weak solution of bichloride of mercury was then forced up in the same manner. Then, on a glass slab he mixed some of Fletcher's white enamel, in order to show the necessary consistence. He was indebted to Mr. Fletcher, of Warrington, for the information that borax retards the setting of oxychloride stopping. Previous to that he had found that sugar delayed it, but borax was rather better. An exceedingly small quantity of powdered borax, added to the liquid on the slab, previous to mixing with the powder, will cause the oxychloride stopping to remain liquid for about two hours before it begins to set. This could be capped over with a quick setting cement and the cavity of tooth filled at once, in any manner the operator pleased. Mr. Stirling then filled the cavity of decay with oxychloride, and pumped it with bristles into the canals. In cases where the nerve has been but recently devitalised, Mr. Stirling treats them with carbolic acid only, before filling; but in other cases he uses soda first, then sometimes permanganate of potash, then bichloride of mercury, and then, always lastly, carbolic acid.

Mr. Wilson exhibited a peculiarly formed supernumerary tooth which he had lately extracted. It was the largest he had met with, and its removal involved the application of some force. The crown was hemispheroidal, $\frac{3}{10}$ -inch in diameter, and the root increased in dimension steadily from the neck to near the apex, where it became rather abruptly truncated and showed signs of absorption. The root was $\frac{1}{2}\frac{1}{10}$ -inch in length, its greatest diameter $\frac{1}{2}$ inch, and its transverse diameter $\frac{2}{5}$, thus giving the whole tooth a decidedly almond form. The position of the tooth was inside the arch between the central and lateral of the left side, and there was another supernumerary, somewhat larger than usual, but having the usual sharp conoid crown, in the corresponding position on the right side. Strange to say, the arch was very little disfigured by their

presence. He purposed making a transverse section of the larger tooth.* He also exhibited a case of dilaceration in an upper bicuspid. The crown had been moved on the root, so as almost to expose the pulp cavity, which seemed to have been afterwards protected by a secondary formation of cementum. The pulp had not become calcified. As to the history, he learned that the patient had, when about three years old, met with a fall, knocking out the upper incisors. Although, latterly, the pulp cavity had become exposed and the pulp dead, the patient had never complained of its giving pain.

Mr. Watson gave details of a case of necrosis of the palate bone, as a result of abscess in second superior bicuspid. The patient, a gentleman, some three years ago had an abscess, arising from a second upper bicuspid, which caused him very great pain, a sinus eventually forming in the median line of palate, not far from junction of the soft and hard palate, and from which there was a constant discharge of pus. The tooth was removed some three months after this, but the sinus had continued discharging. On examination he found there was necrosed bone, part of which was removed and patient told to syringe daily with antiseptic solution. About a month after finding that the discharge was still going on, the sinus was slit up and all the necrosed bone removed. The case was interesting from the fact that it was very uncommon for abscessed upper bicuspids to open on the palate, the tooth which more particularly has a tendency to do so being the lateral incisors.

Mr. Stirling asked if any of the members had ever cut the frænum of the upper lip, where, from its unusually dependent position, it interfered with the security of upper suction cases. He had done so once or twice, and, he thought, with beneficial result.

Mr. Watson had never done so with that object in view, but he had cut it in young subjects, where it was abnormally developed, and was hindering the approximation of the two central incisors.

* On section the root was found to be composed of a shell of ordinary dentine, having an irregular edging of secondary dentine, there being several nodules of osteodentine in their line of junction. The centre was a mass of osteodentine, having only a few, and these slight, connections with the outer shell, almost the whole pulp having become calcified. The osteodentine, which formed fully half the root, showed traces of vessels, and in many places extensive groups of bone lacunæ, with well marked canaliculi.

The Chairman announced that the next meeting would be held on the 13th February, and would be a conversational one. The subjects for discussion would be one on antiseptics, opened by Mr. Watson, and one on combination fillings, commenced by Dr. Williamson.

STUDENTS' SOCIETY,
DENTAL HOSPITAL OF LONDON.

ORDINARY GENERAL MEETING held Monday. Feb. 10th, at 8 p.m. Leonard Matheson, Esq., President, in the Chair.

The minutes of the previous meeting were read and confirmed,

Messrs. G. Dodd and F. Walton were proposed as members of the Society.

The following gentlemen signed the Obligation Book and were formally admitted to membership :—Messrs. E. Bull, C. Gifford, P. Leigh, M. Pike and J. Rogers.

The Librarian announced the reception of one of the volumes of the American System of Dental Surgery, presented by Mr. Hern to the Society. He had also received an old book entitled "Clarke & Snell on the Teeth." This had been kindly presented to the Society by Mr. Breese, an old member of the Society.

On Casual Communications being called for : Mr. G. Hern presented to the Society, for Mr. Baxter Booth, of Crewe, one of its old members, three models with notes on each case.

Case I.—Patient, male, *æt.* 22. Two conical well-developed supernumerary teeth, one on either side, in position between the 1st and 2nd molars.

Case II.—Patient, female, *æt.* 18. On the right side of the upper jaw there was a supernumerary lateral incisor so perfect in shape that it was almost impossible to say which was the extra tooth.

Case III.—Patient, female, *æt.* 10. The peculiarity here was the position and early eruption of the upper permanent canines. On the right side both the temporary and permanent canines were in position, the latter being in the place of the 1st bicuspid. Mr. Hern also showed some fissure burrs that he had found useful in drilling out hard enamel. They were cut both longitudinally and transversely, the result being a number of sharp points which cut very efficiently.

Mr. Barrett showed a new form of separator which he considered superior to Perry's, as it caused less pain and was almost universal.

The President thought that the sliding action of the appliance exhibited would harm the enamel of the teeth. In Perry's separator the claws did not move on the teeth, and thus did not harm the enamel.

Mr. Rilot exhibited models of a case of protrusion of the upper teeth which he had received from Mr. Herbert Williams, of Londonderry, and read a letter in which Mr. Williams asked for suggestions as to treatment. Mr. Rilot in discussing the case said that the chief difficulty lay in the fact of the lower incisors biting up against the necks of the upper teeth. The treatment resolved itself into 1st, raising the bite and then drawing back the front teeth. Seeing that the 2nd molars were just erupting, he suggested capping all the back teeth in order to let the 2nd molars come well into place, and then when the bite had thus been raised, letting the other back teeth in turn accommodate themselves to this raised bite. He was adverse to grinding the lower incisors except as a last resource, and to a limited extent. In regard to the upper teeth what one would strive and get would be a tilting of the teeth (the neck being the fulcrum) rather than simply moving the crowns through part of a circle of which the apex of the tooth would be the centre.

Mr. Dolamore would be inclined to temporise matters for the present. In a few weeks the patient would be losing his temporary molars and he thought it wiser to wait for the new state of affairs before commencing treatment.

Mr. Robbins thought this was a case not to be lightly undertaken. It was necessary to have the full co-operation of the patient or the result would be failure.

The President did not think the outer alveolar plate was thick enough to allow of the tilting operation proposed by Mr. Rilot. Instead of correcting the deformity, it would bring the apices of the teeth through the gum.

Messrs. Schelling, Gardner, and Coyish also commented on this case.

The President then called on Mr. E. Bull for his paper on "Impressions and Impression-taking."

Mr. Rilot opened the discussion. He had tried gutta-percha as an impression material, but it had not been a success. He had obtained it from Ash & Sons, and tried it in his own mouth. Though made so hot as to burn the

mouth, it was still too hard to take a good impression. He came to the conclusion he had not got the right gutta-percha. He thought that the material which gave the peculiar smell and taste to composition could hardly be called "perfume." Anyhow he would prefer the perfume left out.

Mr. Dolamore had tried some gutta-percha given him by Mr. Matheson, but had found it shrink from the teeth. In cases of edentulous jaws he thought the shrinkage might prove useful. At one of the Dental Depots he had heard of a tray similar to the "Sliding Section Tray," mentioned by Mr. Bull. This had been brought out some years back, and had apparently not been a success.

Mr. Robbins remarked that he had had very little experience in the use of gutta-percha. Operators were apt to praise unduly the particular material with which they had had most experience. He would advise those present to try all methods, and then use the one they had found give the best results. He recommended as an improvement on pure wax as a modelling material the addition of a little Canada Balsam, which rendered the wax much more workable. He overcame the difficulty of removing upper impressions from the mouth by raising the cheeks with the fingers and at the same time telling the patient to swallow. This allowed a little air to get in between the palate and the composition, and the impression readily came away. In taking impressions of lower jaws where there was much undercut, he had found it the best way to fill the undercut with a piece of composition, allow this to get hard and then take the impression over that.

Mr. Coysh recommended cooling the bottom of the tray and heating the free surface of the composition over a lamp just before putting the tray into the mouth.

Mr. Harsant could fully endorse what Mr. Robbins had said as to the improvement rendered to wax by the addition of a little Canada Balsam. He did not agree with Mr. Bull that the best way to heat composition was by dry heat. He had found this rapidly destroy the composition. He recommended Glycerine of Tannin as a convenient astringent for painting spongy gums, and sensitive palates.

Mr. Schelling advocated making special trays in vulcanite instead of metal. He found that if the composition were removed from a plaster cast by dry heat, the cast was much harder than if put in hot water in the usual way.

Mr. Gardner advocated the use of plaster especially where

it was necessary to remove something with the impression, as a piece of bridge-work.

Mr. Matheson could not agree with those who thought plaster objectionable. He had always found patients prefer it to composition. This he attributed to its being more easily managed and not pressing back on the soft palate. An easy and rapid way of making a special tray was out of Godiva composition. This of course was only when the modelling material was to be plaster.

Mr. Bull then replied to the various speakers.

The President then passed the usual vote of thanks to Mr. Bull and to the gentlemen who had brought forward Casual Communications.

The President then read his Inaugural Address. [see page 201.]

The proceedings closed with the announcement that the next meeting would be on March 10th, when Mr. Schelling would read a paper on "Gold in Dentistry."

Dental News.

THE MANCHESTER ODONTOLOGICAL SOCIETY.

On Saturday, the 18th of January, the members of this Society and their invited guests dined together at the Grand Hotel; Mr. William Headridge in the chair.

After the President had proposed, in a few eloquent words, the health of the Queen, and it had been drunk with great enthusiasm,

Dr. Parsons Shaw proposed "The Owens College." He begged to be excused any lengthy remarks, and would only call attention to one or two things in connection with Owens College and the matter of education. There were a great many people who seemed to think that education was chiefly a matter of ornament and a privilege that created a select few; and that the proper place for imparting it was in the cloister or the cell, away from the busy haunts of men. Such men also confine their definition of education within a very narrow compass, and denied that anything outside of this range was culture. He never but once got from any such person exactly

what this class meant by culture, and that was a statement that "it was the training which enabled a man to talk on every subject as if he knew all about it." (Laughter and applause.) But he was one who held entirely different views, and had no sympathy with the fantastic assumptions so frequently indulged in by the mere school man; and looked upon everything in education, as in all things else, as useless that did not have some useful end in view.

All study that was merely for the affectation of learning was, to his mind, a waste of time and money that might be devoted to something better. Learning was, therefore, in his opinion, a practical matter from which all pretence and false sentiment should be rigidly excluded, for its true object was to render its possessor of more use to himself and his fellow-men in the profession or calling he has adopted, and a greater blessing to the world at large. (Hear, hear). For these reasons he thought the planting of Owens College in the centre of a great and busy city like Manchester to have been most appropriate. More than that, it followed a precedent, for although the English good-naturedly allow a great deal of loose talk and cant, when they act, it is upon the common sense that has made them great; and the intellectual centres became so because they were, at the beginning, centres of commercial life. Not only is Owens College destined to make the men of Manchester more useful as Manchester men, but its use to us as dentists is beyond calculation. Before its establishment, we had very little, if any, opportunity for dental education. But now it is established, the opportunity afforded at Owens College could be made second to none in the world. (Applause.) And it was for this reason, together with his pride as a dentist, and the great future he saw before him for the dentists of Manchester (if they dealt rightly with their heritage) that he looked forward to the time when, by means of Owens College, and the dental education there imparted, aided by the constantly increasing influence of this Society, Manchester would become one of the greatest centres of dental life. (Hear, hear, and applause). Furthermore, he looked forward to the time when their own Victoria University would not only give them their Licentiate in Dental Surgery, but would take the initiative in granting that higher degree in dentistry which is required to place it where it belongs. (Applause.)

Mr. George G. Campion, in responding, said he was quite satisfied that the Owens College was working in the direction

which Dr. Shaw thought desirable in spreading education, not merely among the few, but placing it within reach of every one. They saw an indication of that in the Local University lectures which were now being given very successfully in all parts of the country. That movement had been initiated by the University of Cambridge, and it had been taken over and supported from time to time by the Victoria University, of which Owens was the principal college; and he was satisfied that the college, in working in this way, was doing its very utmost to advance education among all classes of the community. Referring to the particular department with which he had the honour to be connected, he would say that during the past year or two a very considerable advance had been made—an advance not merely in the number of the students, but in the organisation of the department itself. He might mention what he regarded as a very important matter,—namely, the formation of a special Dental Committee to overlook the interests and work of the dental department. Two years ago no such committee existed, and the special dental lecturers had no means of meeting and discussing what was necessary in the work and organisation of that department. But some twelve months ago a committee was formed which met at certain definite intervals, and it had already performed no slight amount of work. That he regarded as a most important point. It had stimulated and evoked an interest in the work of the dental department which was altogether foreign to it before. Indeed, some two years ago one of the professors of the college told him that the dental department was then looked upon more or less as an experiment, and unless more enthusiasm and interest in it were evinced, the question would arise as to whether it should be continued at all. That was now, he need hardly say, out of the question. The dental department had taken its position as one of the permanent departments of the College work; and it was one which he believed was destined to grow to a very great extent, and to become in a very few years, as Dr. Shaw had said, second to no dental school in the Kingdom. There was another point in connection with the department which he thought was also an advance. The lectureship on “Dental Anatomy” had always been held, previous to last year, by someone who was not a dentist; but a different state of things had been inaugurated; and in the appointment of Mr. Hooton to this lectureship the college had not only gained a very enthusiastic

worker, but had added one more distinctly dental teacher to this department of the college work. Moreover, the committee of which he had spoken had received additional strength by the fact that the college had invited the Staff of the Victoria Dental Hospital to send two representatives, which had been the means not only of strengthening this committee but of bringing the college and the Hospital into closer connection with one another. (Applause.) Looking to the future, he thought it might be advantageous to the dental school in Manchester if a lectureship on "Operative Dentistry" was established. He did not know whether such a step would be considered desirable by the authorities at the Dental Hospital, but it was a point which might be seriously taken into consideration both at the Hospital and the College. If it should be found desirable, it was quite possible that arrangements might be made for such an appointment; and it seemed to him that it would not only be of use to the students but also to the staff of the Hospital who did the teaching. There was one point Dr. Shaw had not named to which he would like to refer, and that was the resignation of Dr. Greenwood, the late Principal. All who had been associated with Dr. Greenwood, or had known him either directly or indirectly, would know that in his resignation the college had sustained a very serious loss. Dr. Greenwood had been Principal of Owens College for thirty-two years, and he did not think it possible that any future Principal could see such a development of college work as Dr. Greenwood had seen during his tenure of this very important office. He was quite sure that he carried with him in his retirement the admiration, the respect, and the kindly regards of every one who had been associated with him in his work at the Owens College. (Applause.)

Mr. T. Murphy, of Bolton, proposed "The Victoria Dental Hospital." He said the fact of a hospital being affiliated with Owen's College was, to his mind, sufficient proof that it had been built on a good and firm foundation. And it would go on and grow, not only to be a benefit to the community of Manchester, but to the members of our profession.

Mr. I. Renshaw, Rochdale, responded, and said that he believed that in the Victoria Dental Hospital they had one of the best institutions of the kind in the country, not only as a charity but as a dental school. (Applause). The Hospital offered facilities which could not be excelled in any other place for students to acquire a thorough knowledge of their

profession. (Applause). This was because, as Mr. Campion had pointed out, of its connection with the Victoria University, and also from the fact that the dental school was in the midst of not only a great commercial but a great manufacturing district, whereby their students were, in many cases, half educated in mechanical ideas before they went to the Hospital for instruction. (Applause.) After quoting some statistics to show the amount of work the hospital was doing, he went on to say that he was glad to find that one great object of the Hospital was to so largely pursue a conservative treatment of the natural teeth; and pointed out that for the month of November, the nearly two hundred teeth were saved that would have been ruthlessly lost if the patients had gone to the mere tooth extractor. (Applause). In this, as well as in other ways, we had a proof of the great value of this institution to the poor of Manchester, who could there gratuitously receive the advice and services of the best professional men in Manchester and its vicinity. (Applause).

Mr. H. C. Quinby, of Liverpool, who proposed the toast of the evening, "The Manchester Odontological Society," said that when, at almost the last moment, he was asked and had consented to propose this toast, he felt that a mistake had been made by somebody; but he quickly saw that the mistake had been his own in allowing himself to accept the flattering invitation, knowing how unable he was to do justice to the occasion. (No, no). He knew so little of the work the Society had done that he could not go into details, but he did know the noble object of its organization, and when he looked back thirty years to the time when he was a practising dentist in this great city, and then saw the kind and sympathetic faces around him this evening he knew, without further explanation, what its chief object had been. Thirty years ago there were a good number of dentists in Manchester, but scarcely any two of them were on speaking terms (laughter), and they stumbled on in a groove, out of which there seemed to be no turning. But when Parliament recognised them as a profession, as true professional men they shook hands with their neighbour; and if the opportunity arose, ventured to tell him how they did certain things; and then often, to their surprise, the neighbour knew of some nice way of doing certain other things, whereby they found, in exchanging ideas, they obtained a *quid pro quo*. Then it dawned upon them that they had been too much shut up within themselves, and if they saw more of their brethren they might

learn something. And thus they emerged from petty tradesmen to that grand exchange of coin for coin that had transformed them into merchant princes in comparison. (Applause). That was the object for which the Manchester Odontological Society was organised ; and it carried out the principles for which it was founded in showing, by practical demonstrations, how the hand could work out the idea which had been developed in the brain. But their own advancement was not all they had to look to. They had still to attract within their influence, and instil the true professional feeling into, the mass of men who hung on to the profession because they were on our register, but had not yet developed the true professional spirit. He thought they should not repel these men, but should encourage them to become members of their societies, and show a disposition to help them to raise themselves. There were thousands on the register, but only hundreds on the rolls of our societies. Could we not do something to change this ? (Applause). The aims of this Society was, he was told, purely scientific ; but if he might be a little critical for a moment, he would ask whether that was all an important Society like this should aim to do ? Professional politics and professional science should, in his (Mr. Quinby's) opinion, go hand in hand. In conclusion, he proposed long life and a prosperous career to the Manchester Odontological Society. (Applause).

Mr. Simms, who responded to the toast, said there was no doubt that the gentlemen who inaugurated this society five years ago were profoundly convinced that such a society would do a great deal to elevate the members of the profession, as it would bring them together and lead to that interchange of sentiment to which Mr. Quinby had alluded. (Applause.) But there were many things the society had to do apart from the reading of papers and discussions thereon. Their rules allowed them to form a library, and members present would, no doubt, be glad to learn that this was now made a certainty by a generous donation which Mr. Henry Campion had made for the specific purpose of founding a special dental library for Manchester, to be under the care of this society.

The other toasts were "Our Guests," proposed by Mr. Dougan, and responded to by Mr. Edwards, of Liverpool ; and "The President," proposed by Mr. Dreschfeld. After the President had briefly acknowledged the toast, the company spent the remainder of the evening in an informal and most agreeable manner.

LEGAL INTELLIGENCE.

ESKELL v. JOHN BUTTERS.

In this case Mr. Justice Chitty in February, 1889, granted an injunction restraining the defendant, until after the 19th of August, 1893, from practising as a dentist within 50 miles of Oxford, the defendant being under a covenant not to so practise. The plaintiff now stated that the defendant had disobeyed the injunction, and asked for a writ of attachment.

Mr. Maclean, Q.C., and Mr. B. B. Rogers appeared for the plaintiff; the defendant did not appear.

Mr. Justice Chitty made an order as asked.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the British Journal of Dental Science.

DEAR SIR,

I have had a curious case, and would be pleased if you could enlighten me regarding it.

Miss M., aged about 35, plump in appearance, and a picture of health, asked me to take out a *loose* upper *left* first bicuspid, to enable her to have a few teeth inserted; of course, I extracted the tooth; in a few days she complained of a pain in her *right* arm, I said there was no connection between the two, but she thought there was; a red rash appeared on the arm, which soon disappeared, but she had no rest day or night; she consulted her family doctor, he did no good; tried another doctor, with the same results; consulted a physician, he said it was nervous debility; went to another doctor for advice, he says it is neuralgia and prescribes quinine and the battery. The arm swells a little here and there, but quickly subsides, it looks quite healthy, but the *skin* is exceedingly sensitive to the touch, and painful or burns on the slightest friction; one doctor has treated for neuralgia, but tells he has done what he could. It is eleven months ago since I abstracted the tooth, and the arm is no better now.

Yours respectfully,

J. T.

Hospital Reports.

MONTHLY STATEMENT of operations performed at the National Dental Hospital Dec. 31st to Jan. 31st, 1890 :—

Extractions	{ Children under 14	294
	{ Adults	443
	{ Under Gas	551
Gold Fillings		56
Other Fillings		313
Advice and Scaling		183
Regulation Cases		58
Miscellaneous		109
Total		2007

EDGAR A. H. FIELD, } *House Surgeons.*
ARNOLD PRAGER, }

Work done at the Liverpool Dental Hospital during the month of January, 1890 :—

Number of patients attended	1986
Number of Extractions	2267
Number of Extractions under Anæsthetics	149
Gold Stoppings	35
Other Stoppings	92
Miscellaneous Cases and Advice	66
Total	2609

H. FIELDER BRIGGS, D.D.S. } *House*
C. B. DOPSON, L.D.S. } *Surgeons*

ANSWER TO CORRESPONDENT.

“CENTRAL”—The matter has been brought repeatedly before the Profession through the pages of this Journal, and as it now stands it is of too personal a character to deal with. If the persons in question are not qualified, you could prosecute them, but if registered, you have no remedy. It is no doubt, a disgrace to the Profession.

British Journal of Dental Science.

No. 532. LONDON, MARCH 15, 1890. VOL. XXXIII.

BACTERIA.*

By D. F. DONALDSON, M. D., Port William, O.

THE subject to which I shall ask your indulgent attention for a few moments, is Bacteria—their classification as to form, and as to nature, a brief description of some of the most important, and the relation they bear to disease in the higher forms of life. I shall not be able to go into detail, but will simply outline the subject, and leave the rest for you to recall from your own readings and observations.

More than fifty years ago the first literature on this subject was placed before the scientific world by Ehrenberg, a German physician, and he called his production "Organisms." Three years later, a Frenchman, Dujardin, published a work called Natural History of Zoophytes, but people were slow to accept the theories presented. A few other straggling writers attempted the subject within the next two decades, but not until the 60's did the subject assume any degree of prominence in the eyes of the scientific.

Then came Pasteur, Muller, Liebig, Tyndall, and a score of others, with ready pens, and the world began to say, "Can this thing be possible?" The investigations of Pasteur solved the problem of fermentation and putrefaction. He found the solution in micro-organisms, also that the diseases, anthrax, pyæmia, septicæmia and chicken cholera, owed their origin to a cause, alike, or near akin. This gave universal interest to the subject, and Lister, with an eye ever to the practical, began his antiseptic surgery and stirred up, in the minds of the scientific, a desire to become more familiar with, and to know more of these minute foes, or friends of animated nature. Investigation followed investigation. The connection between bacteria and infectious diseases was shown to be intimate, and it was left for the patient, persevering Koch, to revolutionize old theories, by discovering the bacilli of tuber-

* Read at the Medical Society of Green County, Ohio.

culosis, and of Asiatic cholera, and proving their identity beyond doubt by cultivation and inoculation. He summoned the medical profession from all parts of Germany to Berlin, and demonstrated before them the methods employed in his investigations of bacteria. He established there a bacteriological laboratory, and from that the methods of research and the means of recognizing the cholera and the tubercle bacilli, are now being widely disseminated.

The rules he works by are as follows :

1st. The micro-organism must be found in the blood, lymph, or tissue of the man or animal suffering from, or dead of the disease.

2nd. The micro-organism must be isolated from the blood, lymph, or tissue, and cultivated in suitable media outside the body, and these pure cultivations must be carried on through successive generations of the organism.

3rd. A pure culture, thus obtained, must, when introduced into the body of a healthy animal, produce the disease in question.

4th and lastly. The same organism must again be found in inoculated animals.

I have not space in this paper to give you methods of isolation and culture, but will refer you for these to works on that subject, such as Crookshanks or Klein's, or better still, a practical course in some good laboratory.

Physiologically, bacteria may be considered as minute cells, destitute of nuclei, differing from vegetable cells by not having the property of splitting up carbonic acid into its compounds ; and from animal cells by being able to derive their nitrogen from ammonia compounds.

Chemically considered, they are composed of a nitrogenous body, 84 parts ; fat, 6 parts ; ash, 5 parts, and undetermined substances 6 parts.

The nitrogenous body is composed of carbon, hydrogen, and nitrogen, in varying proportions.

Histologically, the cell wall is composed of cellulose. Under the action of iodine the cell contents contract and render the wall visible. In some species the walls are pliable and allow the organism a slow vermicular motion, while in others, such as the tubercle bacillus, the wall is rigid and there is no motion. The cell contents, or protoplasm, varies, in some homogeneous, in others granular ; and the great difficulty now in the study of these germs, lies in the staining of the cell wall and counter staining of cell contents ; for some will

act under certain reagents while some will not, and it is only after many different colouring matters and reagents are used on as many different specimens of the same organism that a staining is effected.

Some germs become enveloped in a gelatinous capsule, which may be a secretion of the cell itself, or a substance derived from surrounding tissues. The capsule may surround an individual organism or a chain of them. In some, as the pneumo-coccus of Friedlander, it disappears on cultivation, but reappears on inoculation.

As to nature, bacteria are divided into two classes, pathogenic, and non-pathogenic as to form into three classes, viz : 1st, round or cocci ; 2nd, bar or long, or bacilli ; 3rd, curved or spirillum. The first form, cocci, is the most numerous, they are divided into sub-classes according to their form after multiplication. If a coccus divide and the two remain attached it is called diplococcus. If this again divide and form a line of cocci it is called streptococcus, but if they arrange in rectangular form, a sarcina coccus, but if the division or multiplication result in an irregular cluster it is called staphylococcus or micrococcus.

It is yet an unsettled question whether any of the cocci have the power of motion, or not. Reproduction is carried on by cleavage in the cocci. In other forms by cleavage and by spores—by cleavage when the substance in which the germ exists furnishes plenty of nutrition—by spores when the nutrition is meagre, or altogether withdrawn. The spores seem to be invested in a double cell wall and are much harder to destroy than a full grown germ. They derive their nutrition from their surroundings by absorption. Water is essential to their growth, but desiccation is not necessarily fatal to all germs.

Like all larger forms of creation, heat, light, moisture and electricity form circumstances governing their growth. Each climatic zone has its peculiar form of bacteria, though some forms, mostly non-pathogenic, seem to pervade all zones. They are most numerous in filth, such as sewerage, night earth, and garbage dumps, and especially are places in cities where the building site has been artificially raised by dumping thereon the cleanings of the streets. The integument of the uncleanly, and his unbrushed teeth, form a regular bacterian paradise. Healthy blood and tissue contain no bacteria.

We will now consider the sub-classes of the cocci, or round

form, the streptococci (chain form), number 24 pathogenic, and 4 non-pathogenic forms now known. In appearance under the microscope they are much alike, and can be distinguished only by effects and the different phases of their growth under artificial cultivation. Seven of these forms are found in the pus of abscesses, furuncles, and suppurative points; others are found in erysipelas, puerperal fever, endocarditis, diphtheria, cerebrospinal meningitis, yellow fever, and in various diseases of the lower animals and insects.

Of the sub-class known as diplococcus, the gonococcus is most important. It occurs singly in pairs, in tetrads, or in groups. They are found in the discharges of gonorrhœa, adhering to pus corpuscles or epithelial cells. Their pathogenic character is established beyond question. There are other cocci of this class found in the vaginal discharges and secretions, but of non-pathogenic character.

The sarcinacoccus are of nine varieties, non-pathogenic. Staphylococci or micrococci are more numerous, 16 pathogenic forms and 18 non-pathogenic forms known. Among the pathogenic are found that of scarlet fever, rubeola, pertussis, typhus, acute yellow atrophy, gangrene (in deep layer) and that found in the spinal cord of dogs dead of hydrophobia, though the descriptions of the last named differs some under the different examinations of different bacteriologists. The pneumococcus of Friedlander seems really to take no place in the classification heretofore made, but resembles most the diplococcus, as it is composed of an egg-shaped capsule containing two cocci, each occupying a separate portion of the capsule. It is, however, classed by most of authors among the bacterian or bacilli, though the shape is elliptiform. When an artificial culture is produced in nutrient gelatin, the growth resembles a bright round-headed wire nail suspended in the media.

The second class, bacilli, form a numerous list—pathogenic and non-pathogenic. Among the pathogenic are found the bacillus of leprosy, of syphilis, though it is yet difficult to distinguish between syphilitic and spregmatic bacilli, indeed in many cases of syphilis the bacillus seems to be not present, hence it is questionable whether it has yet been isolated.

The typhoid bacillus presents the appearance of round ended rods, often dumb-bell shape, varying in length, but usually 1-10,000 of an inch. They are of a yellowish brown colour and readily obtained from Peyer's patches, the spleen, mesenteric glands, and lungs of persons dead of typhoid fever.

They readily grow on boiled potatoes, forming a slimy, watery spot, where the culture is located. They can exist and multiply in water unless it be in rapid motion.

There is a form called *bacillus malaria*, found in the tissues of persons suffering from that disease. It presents the appearance of twisted threads, and was first discovered in the soil of the Roman campagna, when the disease was epidemical in that locality. More recent investigations show the disease to be due to the *plasmodeum malaria*, an amoeboid body, having motile filaments constantly present in the blood corpuscles of malarial patients. They are not of uniform or permanent shape, or size.

The tubercle bacillus of Koch is long and slender, and may be straight or curved, and frequently presents a beaded appearance throughout. They occur singly, in pairs, or in bundles, are of slow growth under cultivation, and destitute of motility. A peculiarity of what are called plate cultures of this bacillus is that the colony is always S shaped, pointed at extremities and heaviest near the centre. The long axis of the germ corresponding with long axis of colony. Blood serum forms best media for their cultivation. They are long lived, the spores growing after being dried for 46 days. In man they can be detected in the sputum, tissues, blood and urine, but the sputum is the part mostly used for investigation. This bacillus is very hard to stain.

The bacillus anthrax, or malignant pustule, is very large. In length it may be five times the length of the diameter of a red blood corpuscle. They are from 1-5 to 1-20 as thick, as long. Looking through a glass of low power they look like a tangled mass of threads, but a higher power reveals lines that mark segmentation. They are easily cultivated and stained, and of very prolific growth, animals inoculated from them die within 48 hours thereafter. Some animals, viz., the dog, cat, pig, white rat and Algerian sheep have immunity from infection, and it is with difficulty that the Norway rat can be inoculated. The bacillus anthrax, though very dangerous to handle, is the most easily cultivated artificially, and presents the most beautiful aspect under the microscope of any that it has been our pleasure to experiment with.

Beside the streptococcus of diphtheria there is also a bacillus which is much like the tubercle bacillus, though about twice as heavy. It is found in typical cases, in the deeper layers of the false membrane, beneath the streptococcus. Under the head of bacilli come many more that are associated with

disease in animals, such as fowl cholera, swine typhoid, swine erysipelas, glanders, etc.

The 30th class, spirillum, is not so numerous so far as known. There are but three species pathogenic. That of relapsing fever (Obermeieri); Asiatic cholera (comma bacillus); cholera morbus (Frukleri). That of relapsing fever is long, with regular screw curves, and has a very rapid, undulatory movement. Found in the blood but not in the secretions, and only during the febrile state of the relapse. Inoculations in mice, rabbits, sheep and pigs, give negative results, but monkeys have not the immunity of the animals above named, and the disease is reproduced in them.

The spirillum of Asiatic cholera is curved and looks under the microscope much like the comma or apostrophe marks of punctuation. Hence the name "comma bacillus." In cultivation their line of long axis corresponds with long axis of colony. They multiply with alarming rapidity, and after many artificial cultivations the disease has been reproduced on lower animals by inoculation.

The spirillum Frukleri, or cholera morbus, much resembles that of Asiatic cholera, though thicker and heavier; and when cultivated in a test tube of gelatine, they soon liquify the gelatine and present the appearance of the finger of an old glove hanging in the media. They are very easily cultivated and show rapid growth. While working with this germ in the laboratory last winter, two careless students contracted the disease and had a serious attack on the following day. It was their last work in the laboratory, their experience with Frukleri had been so unpleasant that they chose rather to leave anthrax, cholera, and typhoid alone.

I have now given you a very meagre description of some of the most important of germ species. How they act on the system seems to be under some controversy, but it is generally believed that germs require certain soil, as I may call it, for their growth, and they find this soil, whether it be in the body or not, and utilize it. Here growth and multiplication take place. These places of fertility are reached through the alimentary canal, air passages, exposed mucous membrane, integumentary pores, and open wounds. When these germs find situation they act as an irritant and destroy tissue, and rob the tissues of oxygen. They are carried by the fluids of the body to other localities and new colonies started, and so on till all parts suitable to their growth are taken up. The old germs die and decay, leaving poisonous alkaloids, called

ptomaines, and it is from these ptomaines that disease is generally believed to have its origin, by advocates of the "germ theory." In other words, these ptomaines produce septic poisoning which varies in effect as the ptomanic dose be small or great.

To combat these destroyers, two means are used, viz., antiseptics and disinfectants, the former act by retarding growth, the latter by destroying vitality. Excessive heat, 105° C. for germs and 140° C. for spores is a disinfectant. Excessive cold for most germs is only antiseptic, but some even yield to the first frost, like the yellow fever germ.

Chemical disinfectants may be so diluted as to render them only antiseptic, but antiseptics cannot be so concentrated as to become disinfectants. To destroy these germs outside the body is easy enough, but when in the body, the means used for their destruction outside the body would be just as fatal to host as to guest. Koch has stated that to check the growth of anthrax bacillus in man it would be necessary that 12 grammes of iodine be constantly in circulation, and that the dose of quinine necessary to destroy the spirilli of relapsing fever, would be from 12 to 16 grammes. The use of disinfectants largely diluted, to retard the growth and fortifying the system by furnishing plenty of nutrition, seems, from what is now known, to be the best way of treating these diseases. There must be more investigation, more tedious laboratory work. Each germ must be thoroughly understood, its habits, its nature, its meat and its poison. Its likes and dislikes must be sought after. Take pure cultures of some well known germ and ascertain by experiment the smallest amount of diluted disinfectant that will check growth and multiplication, and the length of time required to render the germ inert through its application, and compare the amount of the drug employed with therapeutic dose of same drug to man.

But, gentlemen, the field is open to all of us. Koch has immortalized himself by discovering the cause. Who will share his glory by discovering an antidote for the effect?

Mrs. Horace Wells, widow of Dr. Horace Wells, the discoverer of anæsthesia by nitrous oxide, died at her home in Hartford, Conn., July 17, 1889. She was seventy-two years old.

IMPRESSIONS AND IMPRESSION-TAKING.*

By Mr. E. BULL.

Mr. President and Gentlemen,

It is with great diffidence that I bring before your notice to-night the subject of Impressions, recognising as I do, the supreme importance it bears to our profession as dental students. The value of an impression will be more fully brought home to us, when we remember the fact, that no model can be an improvement on the impression ; and too often the model and plate show the retrograde steps, which, should the impression remain untrue, will undoubtedly cause the denture to prove a failure.

I hope I may be able to introduce matter which some of you may consider controversial, and thus give rise to a good discussion, in which the many shortcomings of my paper may be, at least, to some extent compensated.

My intention is to deal firstly with the various materials used ; secondly, to briefly describe the principal methods employed in the operation of impression-taking ; and thirdly, to discuss the question of selection of material.

Firstly, with regard to the materials.

Time was, when no impression materials were used, or impressions taken, but the unfortunate patient was made to sit in a chair for days together with a well painted mouth, whilst a block of ivory was slowly let down on the spot. We opine a good fit resulted, since no better model could be had than the mouth itself, but we regard it as questionable, whether the patient or the dentist had the worst of the bargain.

A Frenchman then discovered the excellence of wax as an impression material, and for many years this substance was exclusively used by dentists. From then up to the present time, various materials have been tried with varying success, but only four are now in common use, these being wax, modelling composition, gutta-percha, and plaster of Paris.

For a substance to be of any value in impression-taking, there are certain intrinsic and extrinsic properties that it must possess.

These are—

The necessary softness for taking the impression (i.e., it

* Read before the Students Society, London Dental Hospital.

must be soft enough to copy the finest lines of the mucous membrane, but must also have that consistency which will compress the soft tissues without displacing them.

Must possess the proper hardness for retaining its shape when removed from the mouth.

Must take a sharp imprint.

Must remain where placed (i.e., have no tendency to warp or fall away.)

Must harden promptly.

With undercuts must bend or break with moderate force.

Must be available under conditions existing in the oral cavity.

Must possess no qualities repulsive to patients.

The nearer a material attains perfection in these various properties, the better adapted it will be for our use.

WAX.—The wax used by dentists is common beeswax, which forms the framework of the comb. Virgin wax should be used, and its purity is an essential condition, care being taken that it is unadulterated with tallow.

There are two varieties of wax, yellow and white, of which the former is preferable, since the process of bleaching yellow to obtain white appears to destroy many of its good qualities.

Wax is prepared for the mouth by heating it in water hot enough to thoroughly soften without melting it. It may also be softened with dry heat, but this method is not so good as the former, since wax readily melts over the flame of a spirit lamp.

MODELLING COMPOSITION.—This is the latest and in some respects one of the best materials for taking many sorts of impressions. It is composed of gum dammar, stearine, French chalk, with carmine to colour it, and a perfume to render it pleasant to the patient. The consistency is made to vary according to the amount of stearine and chalk introduced into its composition.

Modelling compound is best softened by dry heat over a spirit lamp, as water appears to destroy its continuity. The tray should also be heated, and the composition rolled into a ball applied to the palatal portion, and kneaded from thence to the rim. By this means a good surface free from creases is obtained, and this may be again surface heated over the lamp before application to the mouth.

GUTTA-PERCHA.—Gutta-percha is prepared from the juice of the *isonandra gutta* tree. It should be used in a pure state, as foreign substances tend to destroy its elasticity. Water heated to about 180 deg. Fahr. should be used to

soften gutta-percha. It must be worked with moist fingers, and before introduction into the mouth should be chilled in cold water ; this is important, since should this precaution not be observed, the patient will be put to some considerable amount of pain owing to the contact of the hot material with the mucous membrane.

PLASTER OF PARIS.—Plaster of Paris is manufactured from gypsum, which is ground and calcined to drive off water. It should be perfectly dry, and there is one essential condition that must be complied with in order to obtain the best results : it must be properly mixed.

The setting of plaster is a chemical process, two molecules of water being taken up to one of plaster. The nearer this proportion is arrived at, the more satisfactory will be the result. It should be mixed in a small bowl, the plaster being sprinkled in until it is entirely taken up by the water, and the mixture is of a medium thickness, it should then be used immediately.

Since pure plaster takes some time setting, it is found advantageous to introduce some foreign body in order to hasten this process. Of the many agents used, potash alum, ten grains to a table-spoonful of plaster, is by far the best. Common salt is also strongly recommended, and its presence is by no means unpalatable to the patient.

It is also very useful to mix some colouring matter, such as rose pink, with the modelling plaster, so that we may the more readily distinguish our plaster impression from the true model when chipping it off during the operation of casting.

We must just give a word to the various sorts of impression trays that are in general use. Years ago, trays were commonly made of silver, but now-a-days they get so battered about to meet the requirements of each particular case, that it is unadvisable to employ any valuable metal in their manufacture. Britannia metal (tin alloyed with lead and bismuth) makes good trays, and is probably as useful as any other material. A complete set should be kept, the operator selecting those that best suit his particular method of treatment.

Practitioners of fifty years ago, found fifteen trays amply sufficient, and Mr. Harris speaks with apparent complacence of having in one instance been absolutely obliged to make a special tray in order to obtain a correct impression. But the exigencies of prosthetic dentistry, as practised to-day, have altered this pleasant state of affairs. It is now necessary in

most cases where we are using plaster to take the impression, and in many a case beside, to make a special tray. I have no time now to go into the details of their manufacture, but I may say they may be made by such methods as striking up a piece of Britannia metal, or pouring tin.

So much for the materials employed. We will now go on *secondly*, to the operation of impression-taking. We will first confine ourselves to general methods, and then particularise a few of the difficulties we meet with, and the means by which such difficulties may most readily be overcome.

The preparation of the mouth scarcely comes under the province of this paper, but I may mention, *en passant*, that all irritants such as salivary calculus, roots, and diseased teeth, that will not yield to treatment, must be removed, and the gums and mucous membrane brought into a healthy condition, before a denture should be made, or an impression taken.

METHOD OF USING WAX COMPOSITION, OR GUTTA-PERCHA.

—We may take these three materials together, as there is little essential difference in the *modus operandi*.

Before taking the impression, the mouth should be dried with a soft napkin, and should the secretions be copious or the gum spongy, it is advisable in some cases to make use of an astringent, such as dilute phenol sodique, for some days prior to the operation.

The position of the operator should be behind and to the right of the chair, and he should be so placed that he can command a full view of the interior of the patient's mouth. The tray and material may best be introduced into the mouth by distending the left side of the lips with a finger of the left hand, pressing the tray against the right side, and passing it in with a rotatory movement. The cup should then be carefully adjusted over the arch without disturbing the material before pressing it up until all the parts are imbedded. The patient may then be instructed to draw down the upper lips, and external pressure on the projecting material must be applied all round the alveolar ridge with the finger, an operation especially important with undercuts. With a good impression, the atmospheric pressure will be great, and difficulty will be experienced in removing the tray, this being best effected by elevating and depressing it with quick firm movements, thus causing the introduction of air between the palate and impression.

The material should be fairly hard before removal is

attempted, and the setting may be hastened by the application of ice cold water on a napkin. Owing to the smallness of the mouth, or the strength of the orbicularis oris, it will often be found difficult to introduce the tray. This difficulty must be overcome with gentleness, the use of force only tending to make matters worse. With irritability of the fauces and adjacent parts, causing retching and uneasiness, we should gently paint these regions with a camel's hair brush, or employ a gargle of camphor water.

METHODS OF USING PLASTER.—In the use of plaster, the patient should be placed upright in the chair, with his head inclined slightly forwards; the breathing may safely be left to itself, but he should be directed not to swallow during the operation. The drying of the mucous membrane is especially important before taking a plaster impression. The cup, having been introduced into the mouth, should be pressed up with the rear slightly in advance of the front, in order to prevent any plaster escaping at the heel and causing irritation of the fauces, or dropping down the throat.

It usually takes from three to four minutes for the plaster to set, and no attempt at removal should be made until a clean fracture results on breaking a portion of the surplus in the bowl. The tray may then be withdrawn as in wax impressions. Fracture of the plaster will usually result, and the pieces must be carefully collected and fitted on to the tray.

Instead of making a special tray for the use of plaster, another method may be adopted. A rough impression in wax is taken, and a layer varying in thickness from $\frac{1}{4}$ to $\frac{1}{8}$ of an inch, tapering towards the rear to prevent a surplus of plaster in that region, is trimmed from this. The wax should then be deeply scored and undercut, a thin surface of plaster run on, and another impression taken.

We will now describe a few of the more difficult cases to be met with in impression-taking.

The most common of these is a dovetail space between two teeth. Two or three excellent methods of operating are open to us.

The offending teeth may be dried, and a small piece of wax fitted on to the undercut portion, this must be well vaselined before taking the impression, or if plaster is being used, wax cut-offs may be employed, causing a fracture of the plaster down the middle of the dovetail.

If the case be such that a complicated fracture is unavoidable, a good plan is to fill such spaces with plaster, which

when set must be trimmed so that no undercut exists, and it should then be coated with gum sandarac. Having taken the impression, the portion in the dovetail may easily be removed by slitting it transversely almost to the gum, when it may be fractured without being defaced, and fitted into the impression.

Another common difficulty is a deep undercut. Wax and composition are of little use, although gutta-percha may meet the requirements of the case, but undoubtedly, particularly if the mouth is edentulous, plaster is the material to use, and it is in these cases that wax cut-offs are extremely serviceable. Strips of wax are placed in the tray, forming a ridge corresponding to the alveolar process of the jaw, two transverse strips may also be placed at points corresponding to the position of the canines. The cup, being oiled, parts from the plaster which is allowed to remain in the mouth. This, when set, is broken off by the operator, the cut-offs anticipating the fractures, and allowing him to remove the whole impression in four or five large portions. The palatal portion may be removed with a special hooked instrument.

There is an excellent method of procedure in taking plaster impressions where only one or two teeth are standing, in which the use of cut-offs is avoided. Strike up the tray so that it touches the crowns of the standing teeth, proceed as above, and the pieces of plaster will fracture across the weak spots above the teeth.

A difficulty often presents itself in mouths where there is protrusion of the front teeth. An ingenious tray has been invented by Mr. David Hepburn to meet these cases, called after him "Hepburn's Sliding Section Tray." It consists of an ordinary tray, with the rim in front cut away, this portion being made to slide along the handle, so that when pushed up it comes into its normal position. The method of operating is to take an impression in composition with the body of the tray, not allowing the material to overlap the protruding teeth, a piece of composition is then placed on the sliding rim, which is pushed home. The two portions may be readily removed separately without dragging.

I may also briefly mention here, Kingsley's method of taking impressions for artificial palates.

When the palate is merely perforated from accidental causes, no special apparatus is required, as only the boundaries of the foramen need to be defined. Great care must be taken however, in these cases, not to use too much impression

material, since the surplus may be pushed up into the nasal cavity, in which case great difficulty will be experienced in removing the tray.

But with congenital clefts, it is essential that the entire borders of the fissure from the apex to the uvula, also the form of the cavity above the palate, should be perfectly represented in the model.

An impression of the lingual surface must first be taken, plaster being used with the greatest success. The next step is to take an impression of the nasal surface of the hard palate. This can be done by filling the lower portion of the cavity above the roof of the mouth with soft plaster, and while it is yet quite soft, carrying the palatal impression against it, having first soaped its surface to prevent adhesion between the two. The two portions may be easily removed separately, the nasal part being carried backward and withdrawn from the mouth with a suitable pair of forceps. The irregular surface of contact indicates their relations when the two are brought together.

Let us *thirdly* discuss the relative merits of the various materials used in impressions.

It appears to me in impression-taking, as in all other branches of our profession, we are too apt to settle down into a routine, and from either laziness or want of enterprise, we jog along in a circumscribed area, enunciating and practising our own views, and thus losing sight of or entirely disregarding the many advantages which may attend another style of operation.

Gentlemen, I can only bid you beware of conservative methods, it behoves us to move with the times, and to make ourselves masters of new theories and new practices, although undoubtedly we should assure ourselves of their advisability and efficacy before bringing them into general use.

I do not hold with the modern craze for plaster impressions. I am quite aware that we shall be told in the ensuing discussion that men taking wax and composition impressions cannot even compete with those that use plaster. Well, all I can say is, that wax and composition have competed and do compete at the present day with plaster, and what is more, with the greatest success. Do not misunderstand me, I would not eschew the use of plaster for impressions, on the other hand, I think nothing else can be used in some mouths, such as edentulous jaws with deep undercuts and cleft palate cases.

It speaks well for wax that for so many years it was the

only impression material used, and although times have altered, yet the callous student of to-day, who uses plaster indiscriminately for everything, would be perhaps surprised at the sharp impression that can be got by a practitioner skilled in the use of wax and composition.

It is the abuse, rather than the use, of wax that has brought it into apparent disrepute with some.

Gutta-percha is extremely serviceable, but it appears to want a great deal of practice for anyone to become proficient in its use. The great virtue of this material lies in its elasticity and power of regaining its original shape, which allow of its employment in undercuts, where wax or composition would be practically useless. Gutta-percha shrinks very considerably on cooling, and hence is used by some in taking impressions for regulation plates, thus securing a tight fit.

In selecting our material, there are two conditions to be borne in mind, a minimum of inconvenience to our patient, and a maximum of convenience to ourselves. For whatever we do, we must remember that a patient seldom feels at home in the operating chair, and anything which will tend to increase his discomfort must be avoided, as far as is compatible with good practice. In this fact lies one of my great objections to plaster as an impression material, for let men say what they will, plaster is very obnoxious to the patient, even with the greatest care. I advisedly leave incompetency out of the question, but probably in nothing is bad operating more painfully apparent, or more discomforting to the patient, than in taking a plaster impression.

Again, our own convenience is to be considered. With the plastic materials we have very little trouble, but with the plaster impression, the necessary preparation, together with the striking up of a special tray, and the subsequent fitting together of the fragments, are sources of great loss of time, and I fear, too often of temper as well.

To sum up these remarks, as a general rule, I recommend the use of wax, composition, or gutta-percha, since they are most comfortable to the patient, and the most expeditious for ourselves, resorting only to plaster when these materials can not be used with any hope of success.

In conclusion, I have to thank you for your kind attention, in listening to my attempt to discuss a subject, which after all, is more practical than theoretical.

THE INTERNATIONAL DENTAL NOTATION.

By GEORGE CUNNINGHAM, M.A. Cantab., L.D.S. and
D.M.D. Harv.*

At the International Dental Congress held in Paris, in Sept., 1889, Mons. Grosheintz, of Paris, made an interesting communication entitled, "Dental Stenography," and in which he suggested certain symbols which he hoped to see become international--so far as the dental profession was concerned. The main features of the communication may be briefly summarised as follows :—

(1) He proposed to represent the teeth by the first letter of the Latin words which are ascribed to them ; for instance, for the bicuspid he employed "B" for the first, and "b" for the second, and the same for the incisors and so on.

(2) Two lines, one horizontal and the other oblique from above or below, would serve to designate by the opening of the angle the right side or left, and by the superior or inferior position of the oblique line to which of the two jaws the tooth belongs.

(3) The temporary teeth (*dents caduques*), are designated in the same way, with the addition of "c" as exponent.

(4) Then by the aid of the figures 1, 2, 3, 4, placed according to the case after the denominative letter, the degree of caries is indicated.

(5) The surfaces attacked by caries are also designated by letters.

(6) He also suggested a series of abbreviations to designate the disease, the medicaments, and the materials employed in filling.

Mons. Dubois, of Paris, whilst strongly supporting the objects sought to be obtained by Mons. Grosheintz, criticised very strongly his symbols, more especially those devoted to the teeth. He then explained the method which he had adopted and recommended in his book, *Aide-memoire du Chirurgien-dentiste*. This method will be explained presently.

Mons. Schwartz, in criticising the symbols suggested, said that he, too, would prefer to see the teeth designated by figures instead of by letters.

* A paper read before the Odontological Society of Great Britain.

I then had an opportunity of explaining the features of a system of notation which has been employed both by others and myself with considerable success for a considerable number of years. As a part of this system I had adopted the method of numbering the teeth employed by Dr. Finley Thompson, who began numbering from the right upper third molar, and counting straight on to the same tooth on the left side, and then continuing from the lower third molar on the left side to the one of the right side, thus finishing opposite where he had commenced. This was done simply to avoid confusion, since his chart of the teeth, and the respective numbers attached were already in use in this country.

Candour compelled me to freely admit that this, of all the systems of numbering, was the very worst, and that years of constant daily use of the system had failed to give me the power of at once recalling with certainty the numbers indicative of certain teeth. Whereas one was able to memorise the Dubois system by five minutes' study for as many, if not fewer, consecutive days.

Mons. Trallero, of Barcelona, proposed that, since the question was one of great interest, and several different systems had been suggested, a commission be nominated to consider the subject and report thereon. This proposition having been accepted the commission was duly nominated as follows:—MM. Grosheintz, Dubois, Schwartz, Trallero and myself.

This commission, first of all, decided that it was better to adopt a system of figures rather than one of letters to designate the various teeth. It was found that all the various systems of numbering teeth by figures might be classified into three systems :

- (a) The system of 8.
- (b) The system of 16.
- (c) The system of 32.

It was resolved that any system of numbering by 32 was inconvenient, confusing and difficult to memorise; it was therefore unanimously rejected.

The system of 8 was warmly advocated. It consists of 4 groups of 8 numerals starting from the median line, the respective teeth of the upper or lower jaw being indicated by the position of the numerals above or below the horizontal line, and their situation relative to the median line being shown by a vertical line on the median line side of the figures.

The alternative (Hillischer's) system, which substitutes a

point or period for the vertical line, was also considered.

The only system of numbering by 16 which was considered was that proposed by Mons. Dubois, which consists of employing all the *odd* numbers from 1-15 to consecutively represent the various teeth on the *left* side of the mouth, and the *even* numbers 2-16 to represent those on the *right*, the lower teeth being distinguished by a line drawn underneath each numeral representing a tooth in the lower jaw.

It was the unanimous opinion that the system of 8 numèrals was certainly the easiest to comprehend and to memorise. It was considered, however, that while the Dubois' system of 16 was slightly more difficult, it was yet sufficiently easy of comprehension, and would avoid in an ingenious manner the necessity of employing any point or vertical line before or after the numerals. It was determined, however, to adopt the principal of the horizontal line as indicating whether the teeth belonged to the upper or lower jaw, which only necessitates the use of the line above the numerals in the case of a tooth belonging to the lower jaw, since the simple numeral, *without* a line below it, is sufficient to indicate its being an upper tooth. It is evident that either of the systems of 8 suggested necessitated three signs for each tooth, whereas this system of 16 only requires one: the number itself, for any upper tooth, and two, the number and a dash above, for any lower tooth.

The Commission then recommended the adoption of the following system of numbering the permanent teeth :

RIGHT.

Upper. 16, 14, 12, 10, 8, 6, 4, 2,

Lower. 16, 14, 12, 10, 8, 6, 4, 2,

LEFT.

Upper. 1, 3, 5, 7, 9, 11, 13, 15,

Lower. 1, 3, 5, 7, 9, 11, 13, 15.

With regard to the temporary teeth, it was decided not to adopt the method of numbering employed in the Hillischer and other systems, which is thus expressed from the median line 1, 2, 3, 6, 7, but simply to adopt the numbers 1 to 10 on the same principle as the permanent teeth, merely distinguishing the temporary tooth from its permanent successor by prefixing a decimal point in front of the numeral.

It is claimed by Hillischer and others that their system of numbering the temporary teeth avoids confusion by retaining the relative significance of the numerals of the permanent set. This claim is self-evident, so far as the incisors and canines are concerned, but not so for the temporary molars, since the gap between the numbers 3 and 6 is decidedly confusing. It was deemed, therefore, simpler and less confusing to utilise the same numbers for the deciduous molars as were employed for their successional teeth, the bicuspid, and not those of their mere namesakes.

The following system of numbering the temporary teeth was adopted :—

	RIGHT.		LEFT.
Upper	10, 8, 6, 4, 2.	Upper	1, 3, 5, 7, 9.
	— — — — —		— — — — —
Lower	10, 8, 6, 4, 2.	Lower	1, 3, 5, 7, 9.

With regard to the symbols to indicate the surfaces of the teeth, it was decided to adopt those employed in the system of notation which I have published. The only difficulty was with regard to the symbol representing the crown or masticating surfaces. This simply arose from the difficulty in finding an equivalent which would be the same in the various languages. The term "crown," or even the mere term "coronal," it was urged, is not employed in France* to indicate the masticating surface. It was, therefore, determined to substitute "t" instead of "c" for the crown surface, as being the corresponding mnemonic contraction for triturating surface (F., *Surface triturante* ; L., *Superficies triturans* ;). It was also determined that, since labial and buccal are only two different names descriptive of the same surface, only one symbol, viz., "l" for labial, should be employed ; the same remark equally applies to the terms palatal and lingual, and therefore only one symbol, viz., "p," has been adopted. The symbol signifying cervical is a segment of a circle ; by accentuating the curve the sign can be made to graphically indicate the extent to which the cervical margin of the tooth is involved.

The following symbols were therefore adopted for describing the surfaces of the teeth :—

* At the time of the Commission, had I remembered that Dr. Andrieu had adopted the term "*coronale*" in his *Traité de Dentisterie opératoire*, p. 353, as applicable to "*la surface triturante des dents postérieures*," I should not have yielded so readily to what seemed a necessary change, since a cardinal factor in the success of any system must be its freedom from any capricious changes.

T., triturating (synonyms : crown, coronal).

M., mesial.

D., distal.

L., labial (synonym : buccal).

P., palatal (synonym.: lingual).

), cervical.

By means of the first five signs and their obvious combinations, such as mesio-palatal, disto-lingual, and so on, it is easy to sufficiently define even any irregularly-disposed carious cavity, *e.g.*, a cavity extending from the mesial over the crown to the distal surface is sufficiently described by the letters, m.t.d. If, instead of a single compound cavity, it is desired to indicate three separate cavities on these several cavities, the use of the colon is sufficient to distinguish the difference thus—m : t : d.: The colon is always and solely employed to define the localisation and the operative terms, and so prevent confusion with any adjacent symbols.

It was further determined not to suggest any further series of abbreviations for the present, as it would be advisable to consider the various systems suggested at greater leisure than the present occasion afforded.

It was further recommended that some mnemonic system, such as that recommended by myself, was more likely to lead to satisfactory results than the system of arbitrary signs so commonly used in America.

This mode of notation, recommended by the Commission, was unanimously adopted by the Congress at its final session.

Despite the fact that this Society, in common with other dental societies, has not hitherto devoted much attention to this subject, I think it is unnecessary to dilate upon the very obvious advantages of having some one carefully-considered system of notation accepted for common use. I trust you will agree with me in thinking that it is a matter of congratulation that the cooperate intelligence of the profession has at last been aroused to the urgency of united action in this matter, and thus made a beginning of reducing to uniformity and order the somewhat chaotic productions of the various individual intelligences which have found expression in occasional contributions to various societies and journals, not only in this country, but also in America, France and Germany. I therefore recommend a trial of this International Dental Notation as being easy of acquirement, time-saving, and eminently practical. Its ultimate value will depend upon the

extent to which it is adopted by the profession. Its value to the individual in keeping a record of his work, in communicating with an assistant, and in corresponding with another practitioner, is evident. But before such a Society as this I would urge its value to science, if only from its help in transforming the crude, almost entirely commercial, entries of the day-book or ledger into the carefully-recorded facts of the case book, the tabulation of which will certainly do much to remove the endless records of vague, unverifiable conclusions with which our scientific literature abounds.

ON NASAL OBSTRUCTION AND MOUTH BREATHING AS FACTORS IN THE ETIOLOGY OF CARIES OF THE TEETH, AND IN THE DEVELOPMENT OF THE VAULTED PALATE.

BY SCANES SPICER, M.D., B.Sc.

(*Concluded from page 200*).

It will be readily agreed, I presume, that the condition of the teeth and gums during normal respiration, *i.e.* through the nose with the mouth shut, is as follows (1) They are kept at a uniform temperature, practically that of the normal body temperature and protected from sudden change by the thick non-conducting tissues of the lips and cheeks; (2) they are perpetually bathed in the warm alkaline salivary fluid, which wells up between them, and washes away any mucus or food tending to stagnate or decompose, as well as any micro-organisms which may have gained access to the mouth; (3) they are constantly being scoured with the alkaline saliva by the almost incessant action of the lips, cheeks and tongue, so as to further ensure the complete removal of *debris* from their surface and interstices.

What will be the change in these physiological conditions if the subject is lying on his back with his lower jaw dropped and his mouth wide open indulging in mouth breathing, taking that as the extreme departure from physiological breathing?

"The teeth and gums will be exposed to a current of air at the temperature of 50°F. (supposing that to be the temperature of the unheated bedroom), after they have enjoyed during the day one of 98°4. The result of this alternation

will be sooner or later to bring about congestion and inflammation of the mouth or pharynx, leading to the increased secretion of strongly acid mucus—one of the chief predisposing causes of caries. Besides, the air being dry, must absorb moisture, and thus tend to inspissate the mucus and render it liable to stagnate and act as a nidus for micro-organisms, whose arrest is also favoured by the spongy state of the gums produced in catarrh. There can be little doubt that the sour taste in the mouth, and the thick clammy paste in the morning after a night of mouth breathing, find a reasonable explanation here; and it is very probable that the extreme variations of temperature act on the vascular supply of pulp and alveoli in such a way as to favour the production of other disorders of those structures.

(2) When the subject is lying on his back with the jaw dropped, and the tongue sunk in the mouth and fallen backwards, as is the case in mouth breathing during sleep, the mouth will generally feel parched, owing to the drying of the parts with which the inspired current comes in contact, and to the escape of the salivary fluids down the pharynx. The teeth are consequently not properly flushed, and any decomposing *debris*, charged with micro-organisms, is allowed to work its full effect wherever it can find a weak spot. The same line of argument would apply if the patient slept habitually on one or the other side, the opposite side on the hypothesis advanced might be expected to show more caries than the other. That the non-existence of a constant flow of saliva is an important factor is seen in great tendency to caries in diseases in which there is a ptialism, as rheumatism and diabetes.

(3) Under the same conditions the teeth are not properly scoured, for the lips, cheeks and tongue cease to be in proper apposition with the teeth, and a similar accumulation of *debris* is favoured. The importance of this factor is seen in cases in which there is extreme adynamia, as in fevers, after which teeth often rapidly decay.

(4) The abnormal stream of buccally inspired air brings into the mouth not only an excess of fresh oxygen but it is also highly charged with micro-organisms—thus in both ways forming abnormal and excessive decomposition and putrefaction in the mouth. In this way the potency of the other adjuvants is intensified.

(5) It cannot be doubted that if mouth breathing is chronic during the period of growth and evolution of the permanent

teeth, the abnormal conditions resulting from mouth breathing will have an influence on the tooth sacs and so lead to an inferior quality of enamel and dentine, so rendering the teeth more prone to the exciting causes of caries later in life.

6. The vaulted palate, the contracted arch and dental irregularity are important predisposing causes of caries, as stated above ; but as rather more must be said on their connection with nasal obstruction and mouth breathing, I prefer to deal with this association directly.

Let us now examine the relative incidence of caries on the different groups of teeth, as shown by the statistics of different observers, and not in any way prepared to deal with the question the influence of mouth breathing in the distribution of of caries.

From these statistics it will be seen that the six lower front teeth, incisors and canines, enjoy comparative immunity from caries. Let us consider their condition even during mouth breathing. The lower jaw drops, and so these teeth remain covered by the thick muscular curtain of the lower lip ; the salivary fluids continue to flush away *debris* and micro-organisms from their surface. These teeth are, further, not removed from the scouring action of the lower lip and tongue, and moreover are not naturally so fitted and calculated to retain particles as are those further back.

Turning, then, to the six upper front teeth, we find that they are far more liable to caries than the corresponding lower teeth. According to Dr. Hitchcock's tables the proportion is 12 to 1, and according to Magitot's tables, 14 to 1. Considering that as far as shape and use go these teeth do not appreciably differ from the lowers, we naturally ask under what external circumstances of their existence do they differ. If we breathe through our noses, there is no appreciable difference, for the tongue, lips and cheeks are in constant apposition, and are constantly scouring both alike with the warm alkaline saliva. In great contradistinction to this is the condition during mouth breathing ; it is difficult to see in a patient with an habitually open mouth, and lying on the back how the salivary fluids are to reach these teeth unless the ordinary laws of fluid distribution are suspended, for the saliva must dribble down the pharynx as it is formed. The same argument applies when the mouth breather sleeps habitually on one or the other side. Only the uppermost side then is likely to be most affected by the mouth breathing. These

teeth stand out high and dry in the inspired current in cases in which there has been long-standing obstruction from an early age ; the upper lip is everted and drawn up, and the tongue is quite far away from them in the floor of the mouth. Such teeth soon become covered with a sticky paste in which micro-organisms are easily arrested, their tissues get invaded and they succumb to caries in a far greater degree than their fellows of the lower jaw as might be expected on the hypothesis advanced. It should be remembered that this mouth breathing, in some persons, continues day and night for almost the whole of life.

Considering for convenience of discussion, the molars proper next, I would support the view that we have here to deal with the teeth which are most used and abused, and which are therefore most liable to accidental destruction of enamel prisms, so permitting the invasion of the dentine by the micro-organisms of caries. Further, the surfaces of these teeth are more pitted and irregular than any of the others, and are therefore more calculated to retain in these pits *debris* and micro-organisms. When to these predisposing causes of caries we have added that these teeth are equally liable to the ill effects of the derangement due to mouth breathing, there will be no surprise that the molars are the most frequently attacked of all the teeth.

That the upper molars are less attacked than the lower may possibly be due to the fact that the upper only are flushed by the parotid secretions during mouth breathing.

For the very great liability of the first molar, I can only suggest that it is possible the most used tooth, and, therefore, the most liable to injury of the enamel.

In the bicuspid we have teeth that are more used than the incisors, and therefore more liable to injury than they. The bicuspid is also more adapted to collect *debris* in their irregularities. The upper bicuspid is more affected by derangements of the flushing and scouring arrangements of the mouth than the lower, and therefore on the hypothesis advanced should exhibit a greater tendency to caries than they ; for the latter being situated in a hollow of the chin are generally more or less flushed by the saliva, even in mouth breathing.

This does not apply to the lower molars, for they lie at a higher level, owing to the direction of the jaw. I would interpret these statistics generally by the proposition that, whereas mouth breathing not improbably influences deleteri-

ously all the teeth alike excepting the lower central 6—10 teeth, it is possible that the factor of functional activity and accidental injury to teeth of inferior quality obscures the share taken by mouth breathing in the case of those teeth which are most used.

In connection with these remarks it would be very interesting to know if the relative incidence of caries in nose-breathing nations does or does not agree with Drs. Hitchcock's and Magitot's well-known statistics; also if animals show a tendency to have disease of the most used teeth; also if caries, when it attacks the upper molars, prefers the labial or lingual aspect. I should be glad of information on these points, as they would afford tests of some of the points I have raised.

The onset of caries agrees with that of nasal obstruction, in that if both had not occurred before the age of twenty-five, the subject is likely to remain free under ordinary circumstances; hereditary influence, which is well marked in caries, is likewise well marked in affections of the rhinopharyngeal tract.

There are many of the points in connection with the incidence and distribution of caries of which mouth-breathing appears to offer no explanation, *e.g.*, why females are more attacked than males.

It remains for me to consider the vaulted palate, contracted arch, and irregularities of teeth in relation to chronic nasal obstruction and mouth breathing.

The frequency of the association of post-nasal adenoid vegetations (thickening of the pharyngeal tonsil)—the chief form of nasal obstruction in early life—and abnormalities of the teeth and superior maxilla, was first insisted on by David (*Revue Mensuelle de Laryngologie*, 1883, quoted by Sir Morell Mackenzie, "Diseases of Throat and Nose," vol. ii.). He asserts that these vegetations reveal themselves externally by a modification of the physiognomy, which consists essentially in a deformity of the upper jaw, with projection of the incisor teeth and narrowing of the palatine arch. He holds that the patient, being only able to breathe through the mouth in such cases, the palate, still in course of development and comparatively soft, is subjected to constant pressure on its buccal surface, and thereby pushed unduly upwards.

Sir John Tomes has observed the association of the V-shaped maxilla with enlarged tonsils and buccal respiration, which are, as a matter of fact, two of the chief appearances found in

nasal obstruction in young people. He attributes the narrowing of the dental arch to undue pressure of the buccinator.

Dr. Greville MacDonald ("The Forms of Nasal Obstruction," p. 63) has observed that, in a large number of patients suffering from these vegetations, the hard palate is highly arched and narrowed anteriorly, and that this condition we may find in adults where little else remains to tell of former obstruction.

In hospital, but especially in private practice, I have been forcibly struck by the large proportion of children with nasal obstruction from adenoid vegetations, who have at the same time mouth breathing, highly vaulted palate, contracted dental arch, outgrowing, anteriorly projecting canine teeth, and minor displacements and overlapping of the incisors of the upper jaw, and have necessarily been led to reflect on the connection between them.

I regret that, although I have notes of most of these cases, I have not had casts and measurements taken before and after treatment of the nasal obstruction. The youngest child in whom I have a record of this association of abnormalities, was eleven; but I suspect that is because the canines erupt about that age, and when in the abnormal position attract one's notice to a thorough examination and record of the whole case. I should suspect that the other abnormalities of palate and teeth are frequently overlooked by the rhinologist, and would be found at a much earlier age if looked for.

The hypothesis which I would offer to the Society was suggested by the well known observations of John Hilton ("Developmental and Functional Relations of Certain Portions of the Cranium," 1855), as to the part played by the vomer and the sphenoidal sinuses in the formation and position of the hard palate.

My hypothesis is, that disuse of the nose during growth of the organism will lead to imperfect evolution and expansion of the nasal framework owing to the physiological stimulus of functional activity being in abeyance. In this stunting all the parts of the nose and its accessory cavities will presumably share. This is supported by the sunken, depressed, collapsed ill-developed condition of the noses of children who ceased to be nose breathers soon after birth from the supervention of some form of obstruction. From this stunted growth there is no reason to believe that the sphenoidal sinuses, and the vomer as well as the rest of the septum nasi, will escape. The consequence is that these structures tend to retain an infantile

position and dimensions ; while the alveoli of the superior maxillæ, and the permanent teeth being subjected to the physiological stimulation of functional activity, rapidly evolve and increase in size. The expression of the stunting of growth of the vomer and septum of the nose and the sinuses is seen along its line of union with the hard palate, which is more or less fixed centrally, while the alveoli continue to grow and increase downwards.

The same nasal obstruction which causes disuse of the nose also compels the subject to adopt mouth breathing. The jaw drops and hangs by the tissues of the cheek from the upper maxilla. The cheek tissues act as ligaments, and pressure is made on the growing alveoli of the upper maxillæ. This causes flattening of the lateral alveolar arches, and shortening of them ; the consequence being that sufficient room does not exist from the eruption of the canines when they are due, and they grow forwards. This, divested of detail, is the theory which I would submit, and which seems to me to harmonise with ascertained facts and received opinions.

As evidence in support of it are the observations of Mr. Mummery (*Odontol. Soc. Trans.*), who has shown the great freedom of savages and uncivilised people from these abnormalities of maxillæ and teeth. Now these are the people, as I have before stated, who enjoy relative immunity from nasal obstruction ; whose respiratory nasal functions are active throughout growth ; and who are characterised by a well-formed and symmetrical nasal framework as well as normal palates and sound regular teeth.

The theory is further supported by the observations that removal of the adenoid vegetations, and otherwise clearing up the nasal obstruction in children at the time of evolution of the hard palate and teeth materially assists dental treatment in rectifying the condition of the upper jaw, though of course the cases that are brought to the rhinologist are brought for other reasons, such as snoring, mouth-breathing, deafness or enlarged tonsils, &c., &c., and not for their jaws or teeth, which, in all my cases, have been under the charge of a dental surgeon concurrently.

I cannot agree with David's theory that increased pressure of inspired air during growth pushes the hard palate up, for if that were the case we should not have the median line the highest point, for it is supported by the septum nasi, and if his views are right, we should expect a vaulting on each side of the median line ; further, the atmospheric pressure in the

mouth, even during inspiration, cannot differ materially from that in the nose.

Just a few words on the insidious nature of mouth breathing in many cases. There are many persons who strenuously deny the habit ; and when their attention is called to it find they can breathe through their noses for a few seconds or minutes, yet in the ordinary way, for the greater part of the day and the whole of the night, these breathe through their mouths. This partial nasal obstruction is almost always liable to aggravation by periodic turgescence of the mucous membrane, and by gravitation of fluid into the most dependent part of the turbinated bodies, which in the recumbent position on the back is at their posterior extremities.

It is not, therefore, sufficient to be assured by the patient that he always breathes through the nose, or even that he does so through each side separately when tested ; it is far more important to enquire for or look for some of the more common results of nasal obstruction, and to examine the nasal cavities. Among the signs on which most reliance can be placed are : (1) open mouth, dropped jaw, and vacant expression of countenance in children ; (2) dry mouth and parched throat during night and in morning ; (3) clammy sour taste in mouth on waking ; (4) snoring and heavy breathing during sleep ; (5) chronic sore throat and other uncomfortable sensations in pharynx ; (6) enlarged tonsils with enlarged glands in neck ; (7) thick tenacious mucus clogging the naso-pharynx, pharynx and larynx, before breakfast ; (8) night terrors in children ; (9) earache, deafness and otorrhœa are exceedingly common consequences of neglected nasal obstruction, especially adenoid vegetations from catarrhal processes extending to the middle ear.

In conclusion, I would recapitulate as follows :

I. The pernicious and widely prevalent habit of mouth breathing—the necessary consequence of nasal obstruction—appear to have some influence in intensifying many of the proximate factors at work in the production of caries of the teeth—(1) by increasing the stream of micro-organisms and of oxygen in the inspiratory air current ; (2) by producing congested and inflammatory states of the buccal mucous membrane, with increased secretion of highly acid mucus ; (3) by desiccating the secretions of the mouth and so favouring their adherence, together with organic *debris* to the pits and irregularities of the teeth ; (4) by the alteration of the positions of the lips, cheeks and tongue in relation to the

teeth, so that the latter cease to be constantly scoured with saliva by the incessant action of the former ; (5) by the substitution of a cold air bath during mouth breathing, for the warm bath of saliva, which incessantly floods the mouth when it is shut, and flushes away any *debris* and micro-organisms that may have collected.

II. The highly arched or vaulted palate, the contracted alveolar arch, and certain irregularities of the teeth of the upper maxilla are very frequently associated with chronic nasal obstruction in young persons. This association admits of a rational explanation on the hypothesis that prolonged disuse of the nasal channels for their natural functions during the growth of the organisms leads to stunted evolution of the nasal framework. The septum and sphenoidal sinuses partake in this, and fail to push down the palatine processes of the maxillæ, while the rest of the face, including the freely-used alveoli, continue to grow. The median line of the hard palate along the attachment of the vomer tends to retain its infantile position. The weight of the lower jaw—which drops to allow of mouth-breathing—acts through the tissues of the cheeks and presses on the superior maxillary alveoli, flattening each curved lateral half, so as to diminish the space available for the eruption of the canines and other teeth, which therefore are compelled to assume irregular positions.

Should further investigation confirm the accuracy of the view that nasal obstruction and mouth breathing act in the manner suggested in the production of the dental and palatine conditions that have been referred to, it is obvious that the restoration of the breathing channels through the nose, and the cure of mouth breathing should be carried out by the rhinologist *pari passu* with the treatment of the teeth and palate at the hands of the dental surgeon.

MENTHOL AS AN ANTISEPTIC.—The use of menthol as an antiseptic as well as an anodyne appears to be increasing, and from the fact that it is probably the least injurious of all known antiseptics it is likely to come still more into use as such. It is especially useful in dental practice from its specific action in neuralgia.

British Journal of Dental Science.

LONDON, MARCH 15th, 1890.

SUPPLYING ARTIFICIAL TEETH TO THE NECESSITOUS POOR.

FOR some considerable time, we believe, the London Dental Hospital has been considering whether any scheme could be brought within the pale of practicability, whereby the really necessitous could be supplied with dentures. From a philanthropic point of view, everything is in favour of helping those who are not in the position to help themselves, but philanthropy, like charity, begins at home, and there has always been a fear lest, if the deserving poor were once supplied with dental substitutes, whether the undeserving rich might not usurp the garb of penury to obtain benefits intended for the impecunious alone. And yet another "home sentiment" has ever been brought forward that if the well-to-do, once learn that the cost price of artificial work supplied to the poor is something low down among the single figures that they will refuse to pay twenty or thirty guineas for work which is practically the same. However, such arguments cannot be held to be altogether cogent in the present case, as the authorities of the institution in question propose to use the most stringent precautions in dealing with applications for false teeth, and believe they will be able effectually to protect the Hospital from the incursions of those whose means are such as to place them above the stratum of society which is usually held worthy of eleemosynary aid. That the public are not much influenced by the knowledge of a cost price tariff, has been abundantly shown already, for although they

can get advice and a bottle of medicine for sixpence, they still frequent the waiting-rooms of gentlemen whose fee is two guineas for consultation, and whose prescriptions cost from five shillings to seven and sixpence to be made up. These gentlemen see the necessitous poor for nothing, or as the case of Guy's Hospital for a nominal charge. How the scheme will work from the social side has yet to be seen, if the precautions promised are as carefully carried out as they have been elaborated, we may hope that no one will be injured and many reap considerable benefit. From another point of view the London Dental Hospital scheme offers great advantages. As we pointed out some weeks ago, the teaching of students was, as far as practical mechanical dentistry goes, quite inadequate to meet the requirements of our students, and insufficient to prepare them for the examinations which they have to pass. This difficulty will, we trust, be now overcome, and ample material and time will be found to place our students in a position to master what is after all one of the most important departments of their life's work. With a skilled mechanic and due supervision by the assistant surgeons of the hospital, students will be most favourably situated for the attainment of a thorough practical insight into mechanical dentistry.

INVITATION TO THE INTERNATIONAL MEDICO-SCIENTIFIC EXHIBITION.—In connection with the Tenth International Medical Congress, to be held in Berlin, August 4th—9th, 1890, there will be an International Medico-Scientific Exhibition. The undersigned Committee of Organization has been authorised by the representatives of the Medical Faculties and leading Medical Societies of the German Empire to make the preliminary arrangements. All exhibits however to be of a scientific nature. The exhibits expected will be as follows:—1. New or improved Scientific Instruments for Biological and Special Medical purposes, including apparatus for Photography and Spectral Analysis pertaining to Medicine. 2. New Pharmacological Chemical Substances and Preparations. 3. New Pharmaceutical Chemical Substances and

Preparations. 4. New Food Preparations. 5. New or improved Instruments for internal and external medicine, and allied specialities, including Electrotherapy. 6. Plans and Models (new) of Hospitals, Houses for re-convalescents, disinfection, and general Bathhouses. 7. New Appliances, such as pertain to nursing the sick, including the methods of transportation, and baths for the sick. 8. Apparatus (new) for Hygienic purposes. The special committee on "Exhibition" consists of the following gentlemen: Commerzienrath Paul Dörfel, H. Haensch, Director Dr. J. F. Hölz, Director Dr. L. Loewenherz, Regierungsrath Dr. J. Petri, H. Windler, and the Secretary General of the Committee of Organization. The names of the Associate Members of the Exhibition Committee as well as the names of the Heads of Departments will be made known shortly, also the conditions for Exhibitors. For applications for exhibits, and information, please address:—Dr. O. Lassar, Secretary General, Bureau of the Tenth International Medical Congress, Berlin, N.W., Carlstrasse, No. 19. Please designate all mail matter relating to the Exhibition, "Exhibition Affairs," and also enclose a visiting card, or card of the firm, on which the name and residence is plainly written or printed. The Bureau is open for the present from 5 till 7 o'clock p.m. The Committee of Organization of the Tenth International Medical Congress:—Dr. Rudolf Virchow, President; Dr. E. von Bergmann, Dr. E. Leyden, Dr. W. Waldeyer, Vice-Presidents; Dr. O. Lassar, Secretary-General.

ASSOCIATION FOR THE ORAL INSTRUCTION OF THE DEAF AND DUMB.—We are informed that the Right Hon. The Lord Mayor will preside at a Dinner in aid of the Funds of this Association on Monday, 12th May next, at the Hotel Metropole.

THE CARE OF THE TEETH IN CHILDHOOD.—The importance of attention to the teeth of children, not only for their immediate comfort, but in view of their future benefit—an importance we have repeatedly urged,—was again emphasised

in a valuable paper read by Mr. Francis Fox at a meeting of the Medical Officers of Schools Association. He said that doubtless many of the dental troubles of adult life are due to a careless disregard of the teeth when first erupted and during the earlier years of life, and that much might be done to combat deleterious influences, especially at that important epoch the time of second dentition. Caries of the deciduous teeth, the deposition of tartar, which has a particularly destructive power, forming a nidus for the growth of bacilli and leptothrix, and rapidly disintegrating the enamel, and alveolar abscess of the temporary teeth, should each be carefully treated. A point which Mr. Fox especially insisted upon was the too frequent neglect of irregularities of the permanent teeth, which are not only disfiguring, but from the increased and continuous pressure upon contiguous teeth, and the difficulty of keeping their surfaces clean, constitute a most frequent cause of decay and early loss of teeth.

DEATH UNDER CHLOROFORM.—Dr. Danford Thomas, coroner for the Central Division of London, recently held an inquest at the Marylebone Coroner's court, touching the death of Mary Frembath, aged 41, the wife of James Frembath, a miner, living at 5, Waterfall Street, Ebbw Vale, Monmouthshire. The deceased suffered from an internal complaint. On the 27th ult. she was sent to London to the Samaritan Hospital for Women at 234, Marylebone Road, to undergo an operation. On Monday last, it was decided to operate, and she was placed under an anæsthetic. Dr. Rutherford administered the chloroform under the direction of Dr. Ammand Routh, of Manchester Square. When half-way through the operation the latter requested Dr. Rutherford to stop, as the pupils dilated rapidly. Artificial respiration was resorted to, but she ceased to breathe. Dr. Routh stated that death was due to syncope while under the influence of chloroform. Answering the coroner, he stated that the latter was administered in the usual form. Out of 4000 cases of persons placed under anæsthetics in this hospital, no death had before occurred. The jury returned a verdict of death from misadventure.

Abstracts of British & Foreign Journals.

DENTAL REVIEW.

OSSIFICATION OF THE PULP—PULP NODULES.

By Dr. H. H. FITCH, Pekin, Ill.

The subject of "Pulp Nodules" or "Ossification of the Pulp," is one of great interest to both patient and operator. "On the 25th of August, 1877, B. W., a strong working girl about twenty years old, came to have two lower front teeth extracted, because they were sore and loose. She had evidently been salivated, and the teeth in question were denuded to very near the apices. She was persuaded to have them treated, and also to have a crown fissure cavity filled in the left lower molar. The cavity was not deep. The only apparent disturbance was the inflammation of the gums consequent upon the use of mercury. The patient complained of great tenderness to the teeth themselves when she "bit anything on to them," and when she "took anything hot or cold into her mouth." The teeth were carefully cleansed, and the gums painted with iodine. This application was renewed every day. In less than a week the teeth were firm and the gums of normal appearance. Still the teeth were sensitive, and August 19th, fourteen days from the first sitting, the patient came again, saying that the filled tooth was killing her. The swollen condition of the surrounding parts indicated alveolar abscess. Immediate extraction was decided upon, after which the tooth being split after extraction he found a little nodule of bone in the very centre of the pulp. This ossification or dentification or calcification was also found in the root canals. Twenty-six days later the patient had ether and three more teeth were removed, and four days later still one more, all in substantially the same condition. The development of the nodules was from the central portions of the pulp. The most marked symptom was the exceeding sensitiveness of the teeth in question to the thermal changes or the slightest pressure. The patient subsequently stated that the other teeth were troubling her the same way. Cases are recorded when one, or at the most, two teeth were affected in

this manner, but not a case where the trouble was so general. Harris gives ossification of the pulp as the result of irritation. This would explain that ossification which follows the wearing away of the tooth by mastication, but hardly a case like the one under consideration. Dr. Homer Judd, of St. Louis, referring to the teeth said the calcification or dentification was evidently eccentric, commencing in the pulp cavity toward the centre. The teeth were very nearly sound with a hard flinty structure and had given a great deal of pain for some time. They were lower molars. He makes special mention of that extreme degree of sensitiveness which has been recognized by others in similar cases, and which is one of the most characteristic signs of this affection. In some cases neuralgic pains of the severest character are induced by the slightest irritation, even by a cold breath of air. He has not made microscopic examinations of these molars, but presume that the dentinal tubes are more or less clearly marked in them. He has seen a good many similar cases and has succeeded in diagnosing the calcifications in several in which the diagnoses were subsequently verified. He mentions several cases where he tried in vain to save some of the teeth, and failed from the fact that the neuralgic pains were too great to be borne by the patient, and upon extraction found both exostosis of the root and nodules in the pulps. Three of these cases are given, in each of which, the patient's general health was seriously impaired for years by the constant nerve irritation thus produced. These patients were ladies from thirty-two to forty-five years of age, and had each suffered from tartar, which may possibly account for their trouble through irritation. In all of these cases the general health was good after the extraction of the teeth. The last case cited is—a lady of thirty came complaining of “jumping pain in her teeth and that anything hot or cold hurt them.” The tartar was carefully removed and the necks of the teeth touched with iodide of zinc, and the patient directed to use quinine. The teeth were practically sound. There had been a little absorption of the gum about the left second upper molar. The pain continued, and on June 18th, extracted one tooth, 20th, two teeth, 23rd, two teeth, 24th, two teeth, 28th, four teeth; 29th, twelve teeth; July 5th, nine teeth. There was no cessation of the pain until the last tooth was out, and there has been no suffering since.

CARE OF CHILDREN'S TEETH.

By Dr. G. B. DILLON, Sterling, Ill.

THE first thing in the care of children's teeth is a proper regard for their cleanliness. Children generally come to us only to be relieved of immediate pain, and when we have done that, want no more of us until they need relief again. In preparing a sensitive cavity for a child, cut away gently, but quickly, so much of the dentine as is necessary to retain a filling. Dry the cavity with cotton and warm air, cover with a light coat of carbolized resin, then over this place a small disc of gutta-percha. If the pulp is nearly, or quite exposed, cut out the centre of disc, put in a drop of chloro-percha and place a second disc over all. The cavity may now be filled, or may remain some weeks on trial, and in the meantime the smaller cavities may be, and they *should* be filled. There is no use, when a child comes to us with one or two aching teeth, to fill or treat them and let the others go. In that way we are almost sure to lose the patient and he lose the teeth. We need not deceive the parent or child, but explain to them the necessity of doing it thoroughly, and of doing it while treating the larger and more sensitive cavities. Tin, or some amalgam composed largely of tin, is, in my judgment, the best filling for all the deciduous teeth, also for the first permanent molars, when they have to be filled at an early age, say, under ten years. In case the deciduous teeth are not eliminated by process of absorption at the proper time, they should be by the forceps. If for instance one of the central incisors is lost and the other retained, the tooth first in will encroach on the space intended for the others, and it in turn will override the first, making an unsightly mouth and predisposing to decay. The same may be said of the cuspids except that the irregularity will be more apparent. At the age of about six years there appears in a child's mouth that useful but much abused tooth, the first permanent molar. and it generally comes into very bad company. All the other teeth are undergoing a process of absorption, and many of them, perhaps, of decay, so that the first thing this tooth touches, even before it sees the light of day, is a conglomerate mass of meat, bread and vegetables in an advanced state of putrefaction and swarming with micro-organisms. It is then part of the care of children's teeth to show them and

their parents these dangers. When you have occasion to extract a deciduous second molar the sixth year molar should be examined thoroughly and if there are any cavities they can be much better filled, especially if on the anterior surface before the second bicuspid takes it place. These teeth are worth all the care and attention we can give them and deserve our best efforts, and so long as there is any hope of saving them with living, healthy pulps. Except in rare cases its loss will not be felt if extracted early, and the second and third molars will come forward without tilting and fill the space and do better and longer service than the three would do even could they all be retained.

Reports of Societies.

THE MANCHESTER ODONTOLOGICAL SOCIETY.

THE usual monthly meeting of this Society was held on February 4th, at the Grand Hotel; the President, Mr. William Headridge, in the chair. There was an unusually large number of members present.

ALTERATION OF THE RULES.

The Chairman declared the meeting to be a special one, and called upon the Hon. Secretary, Mr. Simms, to explain the proposed alteration of the rules.

Mr. Simms said their present procedure in electing members was as follows:—A form was sent to the gentleman who desired to become a member, and he returned it with the names of the gentlemen who certified their knowledge of him; and then the application was brought before the Council. If the Council approved, he was nominated at the ensuing meeting of the Society; and then, according to the rules, his nomination must lie over for two months before the Society could vote upon it. The alteration proposed was to insert the word "next" instead of the word "second," in Rule 29, so that the clause to be altered would read, "After being read to the members at an ordinary meeting, such

recommendation shall lie over until the next ordinary meeting, when the candidate shall be balloted for." That proposal was recommended by the Council, and he had great pleasure in moving its adoption.

Mr. Smithard seconded the resolution, which was carried.

COMMUNICATIONS.

Mr. Skipp then read the following letter :—

"9th November, 1889.

"To the Secretary of the Manchester Odontological Society.

"Dear Sir,—There seems to be a general feeling amongst the members of the Manchester Odontological Society that that Society should have a Library of its own, and with that feeling I most cordially coincide. From ill health, and other causes, as I think you know, I have been prevented from taking as active a part in the working of the Society as I should like to have done. In this matter, however, I feel that I ought to give any little assistance that it is my power to give. I shall, therefore, be glad if you will intimate to the Council that it will give me great pleasure to be permitted to make a gift to the Society of £25, for the purchase of books to form the nucleus of a library, if the Society will undertake the care of them, and provide a suitable place to keep them in so that they may be available for the use of the members of the Society, under such rules and regulations as the Council of the Society may from time to time deem necessary for that purpose.—Yours truly, HENRY CAMPION."

Mr. Skipp said they would all feel greatly pleased at the generous offer of Mr. Campion (hear, hear). A resolution had been passed in the Council thanking Mr. Campion for his gift, and undertaking to spend the money in a judicious manner. (Applause.)

The President said he did not wonder at this offer meeting with so much approval, and he thought it was a step in the right direction. He did not doubt that in time they would have many similar gifts when the library was once started.

THE PRACTICAL DEMONSTRATIONS AT THE DECEMBER MEETING.

Mr. Skipp opened the discussion by saying that, although he had not seen much of the demonstrations given by Messrs. Whittaker, Planck, and G. G. Campion, he had seen sufficient to be able to say they were very good. They were nothing out of the ordinary way, but one or two points he was parti-

cularly struck with. He was sorry that Mr. Planck was absent, as he was the gentleman he wished to attack. In regard to Mr. George G. Campion's filling with Sullivan and gold, he thought the filling was a very useful one, especially in teeth that were of a white and chalky nature, where the decay was apt to creep down between the tooth and the filling and which required an antiseptic filling. In all such cases he thought Mr. Campion's filling would last the longest. In the filling Mr. Whittaker made, he started with soft cylinders and that was a method he (Mr. Skipp) did not altogether approve. He was in favour of soft gold in starting, but not in the form of cylinders. Where soft gold was used he thought it should be of a heavy nature, and well hammered down.

Mr. Whittaker.—I did use the automatic plugger.

Mr. Skipp (continuing)—Well, that is a very bad mallet to use on soft gold. He had also remarked in Mr. Whittaker's filling the complete absence of gold foil. He, himself, should prefer starting at the cervical edge with a small layer of tin, and then to roll some soft gold around the tin several times, put it against the front wall, and then proceed in the usual manner.

Mr. Dougan said, in regard to Mr. Skipp's strictures, he thought a man had a right to fill teeth in any manner he liked if he filled them in a way that answered well. He did not think tin was better on the cervical edges, and he had seen pure gold fillings that lasted quite as long. In regard to Mr. George Campion's filling, it was excellent, and quite out of the common.

Mr. Peter Headridge said that Sullivan had a wonderful power of maintaining itself in a cavity, from what fillings he had seen ; but he should think a good many times before he mixed it with gold. They had the Poulson filling which adhered to the bone surface, and also preserved the bone better than Sullivan, tin or any other composition. He had come across several cases where tin had been used around the thin wall, and the wall had been ground away, proving that if the tin had been a stronger body the thin enamel would not have been broken. He thought those who used amalgams did not like work. (Question.) At any rate, they were not any more durable.

Mr. Simms said that Mr. Headridge was doing an injustice to operators. Referring to Mr. Whittaker's demonstration, he said that gentleman had begun with tin and gold rope

wound together, and he believed that material adhered very closely to the surface. He also thought the chemical action which went on between the two materials produced a combination which was antiseptic, and which preserved the cervical edge of the tooth far better than either soft or hard gold. And it had the further advantage of not needing such deep retaining points, and saved the patient a lot of discomfort from the rapidity with which the first third of the cavity could be filled. None of the "white" filling could compare with gold and tin, for this combination never wore away at the surface. In concluding, Mr. Simms thought that they were all very much indebted to Mr. Broughton for bringing his electric light. He did not think, however, that his "frontal" light would act in practice.

Mr. Whittaker then proceeded to explain on the blackboard the methods employed in his demonstration on the night in question.

Mr. George G. Campion also explained his methods. He said he filled the central portion of the cavity with gold, and above it he put the Sullivan, bringing it up to the enamel and not over. He then put ropes all round the walls of the cavity against the Sullivan, packing it firmly in the side; and putting, perhaps, three or four layers of rope according to size of cavity, filling it up in the centre with the gold; and finally fixing the soft gold well on the surface. He did not agree with Mr. Dougan that the gold on the amalgam was for the sake of appearance. There were good reasons for using gold to cap the Sullivan, because it was often difficult to get an alloy to adhere to the Sullivan; and from experiments he had made out of the mouth he quite believed that, by using amalgam and gold combined, they could more easily obtain a watertight filling than by simply using gold or amalgam alone. As to tin and gold, he could say that where the combination, or tin alone, was well packed at the cervical edge it would last as well, if not better, than gold itself. He had seen a number of fillings where the tooth had been perfect at the gum when it had been filled with tin and gold, but which had failed higher up the tooth where gold alone had been used. In regard to the value of the "white" cements for lining the cavity, as suggested by Peter Headridge, he had seen not a few soft teeth where the enamel was chalky, the dentine very soft indeed, and decay went through the tooth with great rapidity, in which the white fillings had failed and the Sullivan had proved remarkably durable. It

was also antiseptic, which very few of the white fillings were. In regard to putting the tin and gold too near the labial wall, he had seen two or three cases of those fillings turn black behind the labial wall and discolour the tooth, but it was in cases where he had put a lining of soft gold alone against the labial wall. He believed Mr. Broughton's lamp to be a very practical one, and would eventually come into use.

IMMEDIATE TORSION.

Mr. P. A. Linnell read a paper on this subject, and showed several models illustrating some successful work. He said each operation was performed in the manner with which all were familiar, viz. :—with a pair of straight incisor forceps, the blades of which were wrapped with lead foil ; and anæsthetics were used, either gas or cocaine, in each case except the first. The after treatment consisted in adapting a gutta percha splint to the teeth by allowing the patient to bite into a small piece of softened gutta percha, and keeping this on for from twenty-four to forty-eight hours ; of course, giving instructions for its removal at meal times and at night. The gums were painted with aconite and iodine. He thought, however, a better way of maintaining the tooth in position was to tie it with silk to the neighbouring teeth.

Case I.—Girl, age 12 years, right upper lateral, no anæsthetic. Two days afterwards tooth firm, with no tenderness. Second model shown taken a week after operation.

Case II.—Girl, 11 years, left upper central, half grain cocaine injected, in five minutes operation performed, very little pain felt. Two months later right upper lateral was turned into position, gas being administered.

Case III.—Girl, 7 years, right upper central, gas administered, right lateral extracted and central turned into position. Progressed favourably, and a month afterwards second model shown was taken.

Case IV.—Girl, 14 years, left upper central, gas administered, lateral extracted, central twisted. A plate was inserted to force out canine ; when this was nearly accomplished, the patient disappeared, and was unable to complete the case.

Case V.—The operation proved a failure. Girl, age 12 years, gas administered, and the tooth grasped but after using considerable force to rotate, it refused to move and was obliged to abandon the attempt.

Mr. Smithard asked Mr. Linnell if the laterals he had turned had always been successful ; to which he replied he would rather do centrals because they were easier to twist.

Mr. G. G. Campion said Mr. Linnell's notes were interesting, not only on account of the age at which the operations were undertaken, but because there were but few known cases of torsion of laterals, and it was an open question if these teeth could be twisted on account of their roots.

Mr. Simms would like Mr. Linnell to produce the patients he had operated upon at some future meeting. He had seen one where the tooth had turned back. And it was of vital importance in regard to the laterals whether the pulp remained alive.

Mr. Whittaker here exhibited the model of the teeth in a boy's mouth which had been almost completely worn away by constantly grinding them together.

Mr. J. J. Jones next read a paper on "Abscess in the Antrum." He began by laying stress upon the importance of strict attention to cleanliness and a thorough antiseptic treatment if we are to successfully cope with this disease, and called attention to the mistakes often made in not sufficiently opening up the aperture into the antrum. He then proceeded to relate the following cases in practice:—

Oct. 29.—Mr. W., age 32., suffering from severe pain in the left cheek which was considerably swollen, shooting up to the eye and forehead. Supposed the cause to be a decayed root of a molar which had been left in, but upon careful diagnosis, what appeared very much like a badly-diseased fang proved to be a diseased piece of alveolus. The bone was suppurating and carious, and could be broken down with the finger by very little pressure. After cutting away the diseased bone, concluded there was an abscess in the antrum, and pushed a probe into that cavity through opening caused by removal of bone, when out came a quantity of yellowish, purulent matter. After the discharge had somewhat abated, syringed well with Pot. permang. and water, plugged the aperture with carbolized wool, and arranged to see patient next day.

Oct. 30.—Experienced very great relief from treatment; had felt no pain in the eye since. Took out the plug and syringed well with Zinc Sulph. The plug was thickly covered with matter. Told patient to see him in a day or two.

Nov. 1.—Still easy, but matter smelled very strong. Syringed with carbolic acid and water, and again arranged for patient to be sure and see him in a day or two.

Nov. 11th.—Patient came this morning in great pain, especially in the eye, cheek swollen, and bad taste in the mouth. Upon examination, found the plug was out and food particles

were lodging in the aperture. After again probing into antrum, which had made up, discharge followed similar to that when first opened. Syringed well and plugged with carbolized wool. Took impression of the mouth to make a cap for the hole, the object being to keep the hole open, and to food particles from lodging in it. Blamed patient for not coming sooner and advised him to come again in two days.

Nov. 13th.—Easier, though painful under the eye. Treated as before.

Nov. 16th.—Still painful along the cheek to the eye. Syringed with Zinc Sulph., and plugged with carbolized wool. There was a clear passage, when syringed, through meatus into the nose. The size of antral cavity was but small. The bone thin and friable.

Nov. 18.—Less painful : had been bothered by plug coming down. Treated as last visit, and inserted the Vulc. piece as a cap.

Nov. 25.—Going on well, very little pain ; swelling completely gone ; discharge but slight. Cap acts well ; Treated as last.

Dec. 2.—Improving ; no pain ; very little discharge ; same treatment.

Dec. 9.—No pain : no discharge when pressed upon ; gum &c. look healthy.

Dec. 13.—Discharged patient quite well, but advised the wearing of the cap to prevent irritation.

The next case was of considerable interest in that it presented what might have proved serious.

July. 14.—Miss Z—. aged 20, coming over from Isle of Man, caught cold which appeared to settle in her teeth. There was considerable œdema of right cheek and a black eye, which was nearly closed. Much pain. The first and second superior molars were badly decayed and very tender to the touch. Advised her to have both teeth extracted without delay, but to this she would not consent, and refused to have an anæsthetic of any kind. After persuasion, however, she consented to have the 2nd molar extracted, but no inducement after that could prevail upon her to have the 1st molar out, for she felt sure the tooth that caused the pain had been removed as she felt better now it was out. Bleeding came on freely, though there appeared very little matter along with it.

July 20.—The young lady's uncle came this morning to

know if it were possible for the remaining tooth to cause partial blindness, as his niece had suffered very much. On Saturday morning she went nearly blind, had gradually got worse, and this morning, (Monday) she could scarcely see anything with either eye. Advised him to bring the lady down, and he did so. Upon examination of the mouth the 1st molar was very painful and pus was exuding from around the neck. Strongly advised her to have the tooth out, but she still refused. Finding her obstinate, advised her to go at once to the Eye Hospital, which she consented to do and was there told she must go at once and have the tooth out.

July 21.—Tuesday—Took the tooth out, which was followed by a copious discharge of pus; he thought that the tooth fangs had projected beneath the lining membrane of the antrum; and that the temporary amaurosis was due to elevation of the floor of the orbit by the accumulated pus. By the end of the week she seemed to have made a good recovery, the sight being quite restored; and she has since suffered no relapse of symptoms.

Another case, quite different from the foregoing, was that of Mr. W. M——. aged 34, who had for some time been troubled with a purulent discharge from the left nostril. He had been under the treatment of two medical men; in one case for about three weeks and under the other for about two months. They had both treated the case alike for *ozæna*, by injections of permanganate of Potash and by tonic medicines, but without any beneficial effect.

May 29.—Examined carefully the mouth and teeth, which with the exception of the 1st superior molar, appeared in a healthy condition. The molar was not at all broken down, but by tapping with an instrument showed evident signs of disease. Extracted the tooth, the periosteum of which was very inflamed, and at the end of the root was a small sack, which however seemed to be inactive. Was somewhat disappointed as he (Mr. Jones) expected an abundant discharge to follow the extraction. The alveolar maxillary bones were large and very strong. After bleeding had stopped, painted with a strong solution of cocaine and then plugged cotton wool tightly into the aperture, and told patient to come next morning, the object being to open up the cavity by swelling of wool.

Next morning, May 30th, took out the wool, which had acted fairly well, then pushed a probe into the antrum, but very little discharge followed. Syringed into antrum some fluid

carbolate and water through the aperture, which drove out a great quantity of most offensive pus. The patient then said the stench was often so bad at night that he had been obliged to get out of his bed and syringe the nostril. Plugged the hole well and saw him next day. Treated as before except that Pot. permang. was used instead of fluid carbolate. Patient had complained of great pains in the malar bone and the eye, but this gradually subsided till it disappeared altogether; but still the discharge kept up, though the smell was not so bad. After seeing him every morning for about a fortnight, saw him three times weekly for another fortnight, then bi-weekly for some weeks, then weekly, and afterwards fortnightly till cure was effected. Treatment in this case was very varied, and a change for the better dated from syringing with peroxide of Hydrogen and perchloride of Mercury, 1-500. After patient had been under treatment for about three months, told him that very likely a piece, or pieces, of bone would come away, and if he should feel any stoppage at the nose to come sooner than appointed. In a short time, several small pieces of bone came through the meatus into the nostril, after which improvement was very marked.

The conclusion he (Mr. Jones) came to with respect to this case was that suppuration had taken place at the end of fang and had percolated into the antrum; where, forming a nidus, inflammation of one or more of the septa of the antrum had taken place and disease of the bone followed, hence the constant discharge from nostril and exfoliation. The recumbent posture when lying on the healthy side, favouring the discharge, through the meatus into the nose and down the nose into the mouth.

Nov. 6.—Discharged the patient quite well, and have seen him several times since, but there has been no sign of return of disease.

Mr. Simms then gave a short communication on "The Filling of badly-decayed Teeth," especially of bicuspid and molars."

In the first place, they had those fairly numerous cases of "saucer-shaped" cavities in molars, which must be filled without disturbing the pulp chamber, and where this shape of cavity afforded no security to the filling. In these cases, he inserted one, or, by preference, two small steel screws, such as were used by watchmakers, to the depth of $\frac{1}{16}$ inch, or a little deeper, in the solid dentine, leaving the heads of the screws to support the filling. In using these screws, the

dentine was previously drilled to the depth, and in the direction required, with a square ended drill, the calibre of hole in the dentine to be a trifle less than that of the screw to be used, as measured by a burr guage. There was no necessity to previously tap the holes, as the steel screws did this for themselves.

In a second class of cavity, where the buccal wall of the tooth, or a portion of it, alone remained, he (Mr. Simms) recommended the use of a Dental Alloy, or other metal headed pin (such as used for swivels). A hole drilled in the wall, and countersunk, would allow the end of the pin to project into the cavity of decay, and being roughened or bent would afford sufficient hold for the filling.

A third class of teeth which presented difficulties for conservative treatment, was to be found especially in mouths where artificial dentures were worn, supported by clasps placed round the natural teeth. Decay in such cases frequently attacked the buccal, palatal and mesial walls of teeth; and, filled in the ordinary way, were often disappointing, because of the frequent failure of fillings. Mr. Simms suggested that in such cases the simplest and best method of treatment was to crown the teeth by platinum or gold crown. So treated, the teeth were protected from further decay, and their usefulness greatly enhanced.

The President said he had used the screws in one or two cases, and had found them extremely useful, and could strongly recommend them.

After Mr. Collett, Mr. Whittaker, Mr. Skipp, Mr. Dougan and others had expressed approval of Mr. Simms' suggestions, the proceedings terminated.

Review.

Dental Chemistry and Metallurgy. By Clifford Mitchell, M.D. [Keener, Chicago.]

The most obvious trait of this work is its astounding typography, and before dealing with the matter contained in it, an earnest appeal with regard to the manner, must be made to the printer and publisher, that in future editions, if not also for other works in the series, an alteration should be made in the size and arrangement of the type. If this be not done, it means almost certain deterioration of the eyesight of the unfortunate students who elect to use this

work as a text-book, for whilst the large type can be read easily at a distance of 24 inches, the smaller type requires a distance only of 18 inches and this constantly varying lens-accommodation page after page is most wearisome.

One fails to see any adequate reason for the adoption of the extreme variation of lettering, to take only one or two examples on pages 20 and 21 and 88. Induced current and Electrolysis and their explanation appear in heroic type, whilst Faradic battery and terms used in electricity follow in very clear readable and useful letters which might, with great advantage, have been adopted throughout the entire work. Again on page 3. Mobility has small type and Cohesion heroic! No exception can be taken to the clear headings of each paragraph, as these must facilitate both comprehension and reference.

Passing now to the matter of the book one is struck with the inadequacy of the index, which in a text or reference book is a most important item. Then again in what is necessarily a compilation, a more complete list of the works of reference added to the acknowledged sources of certain portions would have been to say the least a graceful concession. Surely, however, the use of the term "remoleculization" must be regarded as strictly original, as also is the insufficient statement that Iodine is prepared from ashes of seaweed. It is usually stated by other authorities that iodine is made by collecting and drying seaweed and submitting it to distillation in iron retorts, part of the iodine being sublimed and condensed in the receiver, whilst iodides of sodium, magnesium and other salts, remain in the retorts, with charcoal in a minute state of subdivision. The remaining iodine is then got from these salts. (Stocken).

There are some very excellent tables given on pp. 24-26 for ready reference. There are many useful recipes for use in dentistry but surely Robinson's remedy does not consist of equal parts of *caustic potash* and carbolic acid, it must be a printer's error for liquor Potassæ and Carbolic Acid equal parts. And here must be emphatically noticed and deplored a very grave omission throughout the entire work, so grave as to suggest the desirability of issuing an appendix containing the proper and also the poisonous doses of the various inorganic and organic drugs mentioned. The book does not pretend to be a *Materia Medica*, but at the same time it carefully gives the antidotes for their poisons whilst except in a very few cases, it makes no mention whatever of the proper doses!

For instance, mercuric chloride is recommended as an ingredient of a mouth wash and 1 grain is freely prescribed sufficiently diluted, but no caution is given, as it most certainly ought to be in all mouth washes, nay in all medicinal prescriptions, that the total quantity of the lotion or medicine shall not contain a poisonous dose, if swallowed by mistake or by intention.

In a book which asserts itself to be "didactic" (*sic*) it is curious to find that "table 13" differs typically from "table 14" and in many cases later on the table arrangement is quietly dropped.

The boiling point of water is said to be 212° F and *zero* Centigrade, whilst of course 100° C is intended, then again specific gravity is said to be taken in water at 39°2. F. on page 8, whereas it should be 59°6° F. as on page 28. Some curiously original definitions also are inserted by way of helping the earnest student on his way—for instance: "Impenetrability :--Property of matter in virtue of which two bodies cannot occupy the same space at the same time. Example : nail driven into wood, particles of wood make way for nail." "Hardness :—Example : A tooth possesses hardness." "Horse-power.—Ability to perform 33,000 foot pounds in a minute." Fluorine and all its compounds so essential in dentistry are dismissed in about ten lines. In these days of electrical research and knowledge the description of storage-batteries is very meagre and inadequate, in fact, the whole section devoted to electricity might be amplified even at the cost of omitting much useless detail in other subjects. There is a summary of the theories of dental caries, which is brief to the extent of inadequacy, and all the credit of the bacterial theory is given to Miller, and no mention whatever is made of Koch's discoveries, nor of Miller and Underwoods' researches, all of which antedated Miller's theories by a considerable period.

Taking this book as a whole the author has laboured to produce a compendious work for students and practitioners, and the sections on laboratory practice are likely to prove interesting, and the chapters on Physical and Chemical and Philosophy might save the addition of another work to the library, but for the very grave omissions and mistakes.

British Journal of Dental Science.

No. 533. LONDON, APRIL 1, 1890. VOL. XXXIII.

GOLD AS A FILLING.

BY CARL SCHELLING.

Mr. President and Gentlemen,—At the last meeting it was announced that I would this evening read a paper on “Gold in Dentistry.” I had not then commenced to write this paper. When I did begin, I soon saw the title was too inclusive, so I purpose confining my remarks to one of the uses of gold, namely as a filling.

The question at once suggests itself, “Why do we use gold at all?” I can only reply, because it is the best filling, speaking generally, we have. The principal objections to its use, are its yellow colour, its great intrinsic value, the difficulty of making a perfect filling with it, its conductivity for heat.

The colour of gold is only of importance when it is used to fill front teeth. If the cavities are small and hidden, it is not seen, and is only rivalled by gutta-percha, for osteos are not lasting in such situations, whilst amalgams, from their liability to stain the dentine, are not permissible in the front of the mouth.

But when the cavities are larger, and involve the labial surfaces of the teeth, gutta-percha, owing to its softness is inadmissible, osteo can restore the contour of the tooth to a limited extent, but soon dissolves, even when it is used for the more exposed portion of the filling, gutta-percha being employed for the part next the cervical edge. The appearance of an osteo too, is never natural, but opaque and dull in contrast with the brightly polished enamel next it. Very rarely, and with great labour, a piece of porcelain is let into such a cavity, but this mode is not yet sufficiently simplified to allow it to be used in daily practice.

It is in such cases that gold can be used with most excellent results, for after placing a layer of one of the cements

over the deep portion of the cavity to protect the pulp from irritation from thermal changes, we can build up any broken-down corners, and restore the contour of the tooth. Such operations, however, should be performed with discretion, for ladies do not always like to see the gleam of gold in their mouths, whilst under a heavy moustache an all gold crown would hardly show.

The kind of surface a filling bears, has a great deal to do with its colour. A burnished filling will look black in some lights, and glitter in others, whilst a dead surface, such as is left after the use of wet pumice powder, cuttlefish discs, or Arkansas, and water of Ayr stones, is far less noticeable; indeed in some mouths with tawny coloured teeth, the dead-gold filling can hardly be detected. In back teeth the brighter the polish the better, as the patient is not so likely to trouble about keeping the filling bright, and the smooth surface will be less likely to become incrustated with tartar.

With regard to the intrinsic value of gold, this added to the charges of manufacturing it, must always restrict its use. Fine gold is worth about £5 an ounce. Gold foil costs from £6 5s 0d. an ounce. The process of manufacture, therefore increases the value of the gold 25 per cent.

With regard to the difficulty of using gold. A genius has been defined as a man with an infinite capacity for taking pains. In order to be a good gold filler it is necessary to take infinite pains, unless one does so at the beginning he will never do good work. In the case of plastics, given an undercut any operator can insert a filling that will last as long as the piece of tooth which forms his undercut remains. Ever since the days of the Royal Mineral Succedaneum, as I believe the original silver coin amalgam was named by its inventors, plastics have been used and abused by all manner of quacks. Now that their composition has been studied and made known by scientists, they are recognised as valuable materials.

A man who can put in a reliable gold filling must be a fair operator. Unless one is very careful in making them, gold fillings are liable to rock, or to come out when being polished. This has led inferior operators to avoid gold fillings, leaving them to those who do careful and conscientious work.

The affluent classes finding fillings made under these circumstances with gold, a metal which is well known for its many good qualities to last, are disposed to insist upon the filling of all teeth with gold, rather than with compounds of which

they know nothing. The only things that deter them being the longer operation, and the probable use of the rubber dam.

To turn now to the advantages of gold. We have in this metal a substance which, when skilfully inserted into a cavity freed from carious dentine, or debris, and properly shaped for the retention of the filling, undergoes no change either of form or colour being quite unacted on by any substance it is likely to meet with in the mouth, and having sufficient hardness to bear without injuring the wear of mastication for a lifetime.

For fillings gold is used chemically pure, being prepared as foil or sponge. Foil is of two varieties, cohesive and non-cohesive.

Cohesive.—Cohesive, or as it is also called, hard gold will be first considered. Gold foil is manufactured as follows:—Chemically pure gold is fused in a new borax lined crucible and cast into flat oblong ingots. The ingot is formed into a ribbon by repeatedly pressing it through the rolling mills until it is about .80 inch thick. The riband of gold is annealed and cut into pieces of about one square inch in size and weighing usually 5 grains each, though some heavy foils are made of 40 grains to the sheet.

Each piece is with a pair of wooden forceps placed upon a leaf of toned paper of peculiar make. When a sufficiently deep pile (technically 'catch') of the alternate gold and paper has been formed, a parchment case, open at both ends, is drawn over it, and this is enclosed in a second similar case so as to cover the edges left exposed by the first case.

The pocket is then beaten with a shorthanded sixteen pound hammer upon a smooth block of marble strongly supported from below and surrounded on three sides by a wooden ledge. The front edge is open and has a leathern apron attached to it, so as to catch any fragments of gold that may escape. Every now and again the beater turns the packet over and bends it to and fro to overcome any slight adhesion there may be between the gold and the paper. The beating is continued until the one inch squares are spread into $3\frac{1}{2}$ inch squares, nearly the size of the paper. The gold is then placed in a similar packet called a shoder, larger than the first, and beaten again. If the packet is unduly beaten in the centre the leaves crack round the edges, but on beating, so as to spread the edges the cohesiveness of the gold causes the leaf to unite again.

The packet is opened and the leaves spread by wooden

forceps, assisted by blowing with the mouth, upon a leathern cushion, where they are cut to one size by a sharp-edged square moulding of cane. The are leaves then annealed, preferably upon a sheet of talc or platinum gauze in a muffle and packed in books ready for sale as cohesive gold.

The cohesiveness of various foils differs, but foil made for experiments from perfectly pure gold has been found to work just like the very best purchased cohesive foil.

By cohesiveness is meant the property by virtue of which the pieces of foil when compressed together become one piece. Freshly made tin foil also has this property. If two pieces of metal be placed in metallic contact, that is, with no adherent gases or moisture or impurity intervening, they will unite. For instance, two freshly cut surfaces of lead if immediately pressed together will cohere firmly. If contact be delayed a superficial oxidation occurs and cohesion becomes impossible. For another example, let us take the welding of iron. At ordinary temperatures the oxygen of the air forms a thick coating of oxide of iron on the surface of the metal, thus preventing metallic contact. If two pieces be heated to redness, and hammered together, they will not join on account of this layer of oxide, but if the smith sprinkles a little sand over where the joint is required the silica of the sand combines with the oxide to form a liquid slag protecting the iron from the oxygen and is itself squeezed out, while the clean surfaces of iron hammered together enter into metallic contact and weld together.

When a piece of gold foil is heated over the flame of burning spirit all adherent and occluded gases and impurities are driven off and the molecules of gold separated slightly from each other. The air has no effect upon gold so the piece may be carried to any similar dry piece of gold and the two upon pressure being applied become inseparably united. This valuable property enables us to execute extensive restorations of the contour of teeth.

The wear of the steel instruments used, is not sufficient to interfere with the cohesion. Steel, being so much harder than gold, is more liable to become gilded than to discolour the gold. A proof of this is found in the steel rollers of rolling mills becoming perfectly gilded, as do the burnishers used in Dr. Herbst's mode of filling.

Some, to avoid any such risk here, used instruments pointed with gold, but one would expect a point of pure gold

to be too soft to exert much force or else to itself cohere to the filling.

Even ivory pluggers have been used, but the animal matter contained in ivory is surely more objectionable than the infinitesimal amount of steel that may wear off a plugger, for as was remarked when speaking of condensing with a plugger, the cohesion of the layers immediately beneath the bur-nisher prevents the deeper portion of the filling being affected.

This property of cohesion prevents the gold from being compressed in large masses, as the layers immediately under the instrument cohere forming a dense scale, which prevents the deeper layers from condensing under such pressure as can be safely applied to a tooth. Foil is used for fillings either in the form of 4 grain sheets folded, until a given piece contains as much gold as it would had it been cut from a heavier number of foil as 32 grain sheets, or the heavy numbers may themselves be used, but the folded gold is found to work more easily. This cut into narrow strips is called tape.

In cases where the thorough welding of successive layers is of great importance, as in contour fillings, it is most necessary to avoid using too heavy gold, 48 being quite heavy enough, and 32 safer for an average operator.

Foil is also used as cylinders. These used to be made by winding tape around a broach. Now foil is formed into a long roll which is cut into cylinders of suitable length by a contrivance, which cuts the gold without compressing it. In cohesive work the cylinders are loosely rolled.

Tape, properly used, without doubt makes the most homogeneous filling ; most good operators, even if they use cylinders, finish the surface with a veneer of tape.

The following is a rude illustration of their respective merits.

Suppose a room and a supply of stair carpet. The room is to be fitted with the carpet which is supposed to be cohesive like gold. If we packed the carpet in, starting flat on the floor, and folding it over and over from wall to wall from below up, when the top was reached the room would be well filled with a very homogenous mass. This is like our tape filling.

Suppose the carpet to be loosely rolled into cylindrical bales and pitched in anyhow, and pressed down by a strong hydraulic press. The surface would be very uneven, some parts of the floor being covered by several bales, one on top

of another, other parts being one bale only. Though the room would be well filled it would not be so homogenous. This is our filling with small loose cylinders.

Should our bales be tightly rolled or large they would be separated in parts by clefts, and would be much wrinkled themselves by the pressure, so that a probe would find weak places or clefts. This comes of using too large cylinders.

I recently saw a case in which a year ago I did a large contour filling entirely with the mallet and Wolrabs cylinders. The edges were good, but the surface was slightly pitted, thus showing that my filling was not so homogeneous as tape fillings generally are.

When portions of gold are once welded together it is most difficult to move any portion from its relation to the bulk of the filling.

When finishing a small gold filling one may sometimes notice a cleft between the gold and the wall of the cavity. This has been formed owing to negligence in not packing the tape well against the walls, and in such cases it is useless to attempt to burnish the gold against the cavity wall. The only good course is to cut out the gold to some depth, and fill the cavity *carefully*. Gold does not extend laterally when condensed with a flat ended plugger. With a convex-faced instrument, grooved in one direction, it is said by some to extend slightly in the direction of the grooves, but this is not to be depended on in practice.

It is a safe plan, after a floor of gold has been firmly started, to lay one end of a strip of gold tape upon it, and to condense until the condensation nearly reaches the wall of the cavity, then to turn over the piece of foil, leaving a good-sized loop lying against the wall, to be subsequently well driven into the angle between the floor and the wall. Should this care in leaving the gold as a loop or fold not be taken, but the piece of tape bent back anyhow, the bend will be a little short of the wall of the cavity, and the filling will not fit.

It is to this indirect form of blow that we must generally trust in packing towards the walls, as but seldom can we turn the face of one instrument directly against all sides of the cavity.

Unless the greatest care be taken, a cohesive filling is sure to prove leaky. Mr. Tomes found it a matter of the most extreme difficulty to make water-tight fillings with cohesive foils even in teeth fixed in a vice and remarks, that he could

only do so by using small portions at a time with the most extreme care.

Although it is true that all gutta-percha and most amalgam fillings leak and still preserve teeth, yet in the case of amalgam, at all events the formation of antiseptic salts upon the surface of the filling may account for its usefulness and permanence. But in the case of gold it is absolutely certain that no decomposition can take place, and that it saves teeth entirely by its close adaptation to the cavity walls enabling it to keep out all extraneous matters.

The condensing power may be applied to the instruments by hand pressure or by the mallet.

The advocates of hand pressure claim, that though their fillings are not so dense as malletted plugs yet they are sufficiently so to fulfil all requirements, and that clinical experience shows, that in cases in which much contouring is not required they are not inferior in durability. Patients often find it less trying than the mallet, whilst the readiness with which gold can, by suitable pluggers, be placed in difficult cavities and undercuts gives them an advantage over the mallet, as this only gives its blow very slightly out of the line of its long axis and so is prevented from reaching such places. Back action and right angle mallets have been introduced to remedy this defect in the ordinary direct action instruments but still many of our foremost operators who use the mallet in all accessible cavities use hand pressure when the mallet could not be used without cutting away an unduly large part of the tooth.

Of mallets, those which give a direct blow without antecedent pressure are to be preferred as the Electric, Engine, pneumatic and hand mallets, though the usual Snow & Lewis automatic does very good work in spite of the theory that the pressure spoils the gold before the blow reaches it.

The working surface of the plugger demands some consideration. It is said that all pluggers should be slightly convex to spread the gold. Rough and deep serrations make fillings which do not finish well, and are liable to chop up the gold and chip the enamel, whilst fillings made with finely serrated pluggers take a high polish. Some use round ended instruments, merely roughened with sand paper occasionally, and find them work well.

In extensively decayed front teeth having healthy pulps cohesive gold is of the greatest use. It would not be justifiable to destroy a healthy pulp for the sake of pivoting the

roots, but by using cohesive gold we restore the teeth to usefulness and a more sightly condition, thus making use of truly conservative treatment.

Non-cohesive, or soft gold.—This is so called because if two pieces be pressed together they never unite.

It is prepared from cohesive gold by exposing it to ammonia gas or to the vapour of sulphur, in order to destroy the cohesiveness of the foil by making the surface chemically impure.

A very soft gold is made by packing alternate layers of foil and a peculiar unsized paper—in an iron box and subjecting the whole to a heat sufficient to carbonise the paper. It is suggested that iron, in some form, is used by some makers to destroy the cohesive property of gold.

Should any part remain cohesive it will considerably interfere with the manipulation, as it is most essential that each leaf shall be free to move over its neighbour. This property enables many parallel leaves in the form of a block or cylinder or of tape to be compressed at one time.

A non-cohesive filling should consist of parallel sheets of gold, in close apposition to each other, reaching from the deep part to the surface of the cavity and kept in place by strong boundaries.

In inserting a non-cohesive filling no condensation of the ends of gold which are to form the surface should be performed until the cavity has been well filled by lateral pressure, condensation of the surface then causes the fillings to bulge slightly and to still better adapt itself to the walls of the cavity.

It is comparatively easy to make a watertight filling of soft foil, as in that form, gold may be more easily packed against the walls, especially when in the form of cylinders with their ends upon the floor of the cavity, whilst the whole mode tends to cause pressure to be exerted towards the walls and the absence of cohesion between the leaves of foil allows this pressure to be transmitted.

When the surplus gold has been dressed off the forcible application of a burnisher will, if possible, still more condense the whole filling and impart a dense and bright surface and cause adaptation of the edges.

Having finished the consideration of cohesive and non-cohesive gold used separately, let us consider the combination of the two. Being unable to find any authoritative statements on the subject, I requested Mr. Storer Bennett to give me the benefit of his experience, which he did as follows.

“Soft, or what is known as non-cohesive gold, if kept free from moisture and used with as much care as possible to keep it clean, never being touched with the fingers, &c., becomes cohesive when annealed, and if worked in small pieces presents all the qualities of what is known as hard, or cohesive gold from the first. If a cavity is filled with soft gold beginning with gold unannealed but the same care being exercised, as regards handling, &c., as with the hard gold, then, by merely annealing the soft gold it can be built on the previously unannealed gold with the utmost facility, provided that the soft gold has been thoroughly condensed (and for this purpose a heavier and deader blow than the electric mallet is required) and that the surface of the soft gold is left rough.”

“By this means a large proximal cavity in a molar or bicuspid tooth may be filled with large pieces of soft gold for one half or two-thirds its extent, and the remaining portion built out with annealed foil, a great saving of time being thereby effected.”

“Cohesive (*i.e.*, soft but annealed gold) may be built on to a rough surface of tin with an admirable result, where the tin is used near the neck of the tooth.” Mr. Storer Bennett concludes by remarking that the methods mentioned have been employed by Mr. Woodhouse and himself for many years.

An alternative method of starting the hard gold is by placing on the soft gold, three cylinders of which the middle one is annealed, the two side ones serving to hold it in place until it is compressed; but this is practically the same as the above method, for as the soft gold of course has not cohesion between its component cylinders, the hard gold cylinder cannot be said to be dovetailed in place, but instead of, as in the above case, the cohesive gold being started in one plane, it is started on a bent surface.

The union between non-cohesive and cohesive gold is accounted for by the penetration of the long points of the deeply serrated pluggers rendering the soft gold cohesive where they penetrate.

In Dr. Herbst's method, which consists of burnishing loosely rolled soft gold cylinders against the cavity walls, a curious phenomenon is taken advantage of. As the burnisher rotates upon the surface of the gold it becomes hot and gilded, whilst the gold in the cavity is found to have acquired a beautifully cohesive surface. Thus, though soft gold is

used, cohesive fillings result. The heating of the gold by friction is thought to explain this.

With regard to crystal gold, which is but little used in England, but greatly in America. It is made either by removing the mercury of an amalgam of gold by nitric acid or volatilisation, or by Watt's process of precipitating gold from a solution of its chloride by electrolysis.

It is sold in cakes from which the operator tears small pieces with his conveying forceps.

In that made from amalgam the crystals are octohedral and normal in form, but in Watt's gold they resemble fern leaves being much interlaced.

In using such material one would expect great care to be needful, for whilst a badly condensed foil filling would show numerous clefts in its substance, sponge gold would indeed resemble sponge. The following is from a recent journal—"It is an easy material with which to make inferior fillings for a short time but in order to do superior work it necessitates more time and care than foil and no matter what care is taken the fillings are not so absolutely cohesive as if foil were used.

The writer used finely serrated pluggers. Sponge is said not to ball up under the plugger so readily as foil, so that fillings are easily started with it. It may be used to fill up the centre of a filling, after foil had been impacted against all the walls, and appeared to work well to. It is rather wasteful and difficult to convey to the tooth, much of the gold dropping as powder.

In a paper written by a student, one does not expect the economics of gold filling to be considered. At this hospital it seems to me that the patients generally get treated as they theoretically should be, for our time has not to be considered, and so does not unduly increase any bill. If the gold is forthcoming to fill the cavity with, and the patient willing to undergo the operation, I should say that for almost any permanent tooth gold is the best filling. The exceptions being teeth under treatment for exposed or necrosed pulps, or with diseased periosteum, or so far decayed that crowning would be better practice, or so poorly calcified that they are not hard enough to allow gold to be properly condensed in them, or in cases in which we cannot put in a reasonably good filling, owing to either the smallness of the patient's mouth, or to lack of sufficient skill on our own part. There can be no doubt that unless we have reason to believe we can put in a

good gold it is far more satisfactory to all concerned to put in a good amalgam, or an osteo, rather than a gold filling, which does not fairly exhibit the virtues of gold as a tooth saver.

In conclusion, I beg to acknowledge the kindness of the members of the staff in answering many questions on this subject for me, and to thank you for your kind attention to a paper which, though I fear unduly long, has done but scant justice to such an important subject.

UNUSUAL FORM OF TUMOUR OF THE CHEEK.

By Dr. MAX BARTELS, Berlin.

Dr. Bartels, who occupied the chair at the meeting of the Free Association of Surgeons of Berlin in November last, gave an account of a very rare tumour of the right cheek. The patient, a strong hearty woman of 60, had noticed the tumour 28 years before, when it was situated quite close to the angle of the mouth; it was then, according to her account, about two fingers wide, so that it would appear to have existed for some considerable time before. It grew slowly but steadily, without causing her any pain or inconvenience. Two years ago, she accidentally wounded the tumour with a comb, and the small wound, which bled very profusely at first, soon gave exit to a quantity of pus, which would amount to almost a litre a day. The patient now hoped that the tumour would suppurate away entirely, so she set to boring the tumour in every direction with a needle, each séance being followed by free hæmorrhage. The tumour recently began to increase largely in size, so that she wished to have it removed, and applied to Dr. Thorner, who brought her to Dr. Bartels for the purpose of operation. The growth occupies the whole of the buccinator portion of the cheek, its broad base springing from the soft parts of the cheek. It has somewhat the shape of a large long apple, and its base reaches from the zygoma above to a little below the angle of the mouth, and from the naso-labial fold to the anterior border of the masseter. The tumour is dragged down by its own weight, so that the summit reaches as low as the border of the lower jaw. The patient wears a kind of suspensory bandage to support the tumour. The skin is quite

moveable over the lower part of the growth, but at the summit around the fistula it is discoloured and adherent to the parts beneath. The tumour is quite painless, of a soft elastic consistency, not adherent in any part with the bones; the tumour projects somewhat into the cavity of the mouth, and carries the mucous membrane with it. The glands of the lower jaw on either side are enlarged, most likely owing to the neighbouring suppuration, but the parotid region is quite normal.

The tumour was shelled out with difficulty, the hæmorrhage being free; the skin was spared as much as possible. The enormous gap in the cheek was then closed by a plastic operation. In six days the wound had closed with the exception of a punctiform spot close to the angle of the jaw, from which fluid constantly exuded, and which still remained open two months after the operation. Since then the patient has been lost sight of.

The examination of the tumour by Dr. Virchow showed it to consist of a central nodule of almost pure fibro-cartilage, surrounded by large numbers of pseudo glandular tubules supported by a framework of widely dilated vessels (telangiectasis). Scattered here and there in the substance of the tumour there were a number of melanotic spots full of pigment. The malignant character of the growth is shown by the presence of a number of accessory nodules branching from the large mother centre.

Dr. Bartels has been unable to find any record of a similar case. With the exception of epitheliomas the tumour of the soft parts of the cheek are of very rare occurrence. Including the present one Bartels has only found nineteen cases in medical literature, and as of this number twelve were men and four only women, it would appear as if the male sex was much more prone to these growths than the female. Both sides of the face would appear to be equally affected (six on the left to seven on the right). With the exception of a new-born child all the other patients were adults (six between 18 and 30, and ten between 40 and 70). In most cases the tumours had existed for a considerable time ($1\frac{1}{2}$ to 7 years; 1 for 28 years; 1 for 43 years); they belonged to the most varied forms of growth. By far the larger number were lipomas (7 true and 1 angeolipoma) so that this form may be said to be the most frequent form of tumour of the cheek. In many cases they have been supposed to be cysts, and have been punctured before removal. These tumours gener-

ally spring from the layers of fat in the canine fossa. The fibromas and sarcomas have their starting point in the connective tissue of the cheek. The point of origin of the enchondromas, adenomas and their mixed forms must be sought in the glands, for such growths have been found in numberless instances in the parotid and submaxillary glands. It appears most probable that the small glands, which according to Henle, Sappey and others, surround Steno's duct at its point of entrance into the mucous membrane of the cheek. It was at this spot close to the angle of the mouth that Dr. Bartel's patient had first noticed her tumour.

PREPARATION OF THE MOUTH FOR THE INSERTION OF ARTIFICIAL TEETH.

By FRANK HAMPTON GOFFE, L.D.S., Eng. & Edin.,
Assistant Surgeon to the Birmingham Dental Hospital,
Dental Tutor, Queen's College.

A GREAT many older practitioners lament the decline of mechanical work, and compare it unfavourably with the practice of former years. I think, however, that with the selection of the various materials and teeth at our disposal a dentist can exhibit more skill and artistic workmanship now, than was hitherto possible, and when I see porcelain crowns and dentures inserted showing considerable constructive and manipulative ability I have great hopes for an increasingly high place in our profession for prosthetic dentistry.

I consider it would be very desirable if gentlemen with large practices would recount their failures, as no doubt many continually occur. For you constantly hear of patients who are unable to wear a denture with comfort; I possess a box full of discarded teeth, many of them well made, and by men holding the highest position, proving how some little fault has disappointed the wearer.

There is, unfortunately, a feeling amongst qualified dentists to disparage mechanical work and think they take a higher position by devoting themselves to surgical and operative work, and consequently, after taking the model of the mouth, hand it over to their pupils in the workroom for future manipulation; this is a great error, as these have never seen the patient, and have simply the model to guide them.

The teeth fulfil several important offices, viz., mastication, articulation and personal appearance ; and it is for any of these purposes that the dentist may be required to supply artificial dentures ; it is very important to bear in mind, that personal appearance takes a most important place with the bulk of people, even those who seek our aid in consequence of impaired digestion, think that while mastication is being restored they might also have their personal appearance improved, and, for this reason, the one who sees the patient certainly ought to superintend the work in the laboratory.

There is something else for a dentist to do beside extract teeth and supply new ones ; it is right that as many teeth as possible should be saved, but we must not allow ourselves to think, as some of our teachers would have us do, that there is only one way of doing this, namely, by filling. Each will have his own particular fancy, one by filling, another by cutting down to the edge of the gums and putting on a new crown. Each may be equally successful in his way ; but I think that with a great many operators filling is overdone, otherwise we should not see the unsightly exhibitions of huge white fillings and gold contours showing right in the front of the mouth, this is certainly not my idea of æsthetic dentistry. I think very few people will deny, that a more lasting piece of work might be made and the appearance benefited, if a new crown were mounted or a porcelain front added.

A question very often arises in our minds, whether or no to recommend people to have old roots extracted. Some only remove them if they are aching ; as a rule, if there are many fangs remaining, I certainly believe they should be removed, for at any time they are apt to set up inflammation, the root has to be extracted, and consequently, some amount of misfit results in your plate.

The roots of an incisor or canine tooth should not be extracted when it is the only missing tooth in the front of the mouth, but, if left, it ought certainly to be filled. Should the root be lost, it can easily be replaced by a gum tooth. These are not used so extensively in Birmingham as they deserve to be, for no other teeth restore the contour of the jaws and match the gums so well.

As a general rule, I should state that remaining teeth, which are incapable of being fully restored to health and usefulness, should be extracted, and if a tooth on one side of the jaw near the front of the mouth has been lost, and the fellow

one on the other side decayed, it is always advisable to remove it to have both sides of the jaw symmetrical.

We not unfrequently meet with people, who will suffer extreme agony rather than submit to an operation, which would probably not cause as much pain as they have endured for weeks.

Patients will sometimes express great disappointment when they seek a dentist's advice, and he informs them, that their mouths are not in a fit condition for artificial teeth, and that they must submit to an extensive operation for the removal of the decayed roots and teeth, before any artificial substitutes can be inserted. This very often arises from the fact, that they have heard or read advertisements, telling them of wonderful operations, which it is very difficult for us to believe any sober minded person can credit.

Some will probably insist on having their own way, and should the dentist ultimately consent to perform the work, as they wish, the new teeth will be placed on painful and loose roots, increasing the inflammation, so that, in time, the teeth are discarded, and dentistry is made to bear the discredit. Therefore, in cases where patients will not act on the dentist's advice, he would consult his reputation far better if he refused to do the work.

Any accumulation of tartar, which most commonly collects round the buccal surface of the upper molars and the lingual surface of the lower incisors, should be carefully removed, to enable you to obtain a sharper model. Tartar is apt to cause an irritable state of the mouth, and the after success depends, on this being thoroughly attended to, for, if any tartar remains, it forms a nucleus of further deposits. To smooth the scaled surfaces they should be polished with pumice powder and wooden points.

If the patients desire to have any teeth extracted, they may prefer to have them out one by one, or have them removed under the influence of an anæsthetic. If the latter is decided on, you have, then, to make up your mind, whether to administer nitrous oxide two or three times, or ether once. It is very annoying, after giving gas, to find that a root still remains, which you are unable to remove; so, if you think there is a chance of the operation not being successful, it is wise to give ether.

We will suppose the case is now ready for artificial teeth. Before taking the model you should examine the mouth, noting carefully the height of the palate, the shape of the

arch and the general characteristics of the alveolar edge. Another very important point is the hardness or softness of the tissues, at times you find the ridges hard and soft in different localities. The soft parts occur at the posterior part of the hard palate at its junction with the soft palate. Directly in the median line is a hard ridge ; this must be remembered, as it is there that dentures are very apt to rock and on each side of this median line the soft tissues are found.

If any teeth remain, these should be studied, to observe if there are any undercuts which may drag in removing the impression, so that you may finish up your plaster model and trim it to an exact reproduction of the mouth. I have not entered into the merits of the various materials for taking the impression of the mouth ; some prefer plaster of Paris, and some modelling composition. The material used is not so important, as the amount of skill exercised.

If the patient has had a number of teeth removed, it will be from six to twelve months before the alveolus has sufficiently absorbed to warrant you inserting a permanent set of teeth ; so, in these cases, it is far better to make a temporary set. These temporary sets can be made as soon as the patient has recovered from the effects of having the teeth extracted. I have put them in two days after the extraction with perfect success. It has been proposed to take the model immediately the teeth are out and put the teeth in the next day. I do not think this a good plan, for, however carefully you remove the teeth, some swelling takes place at times. It is also better to allow the patient to get over the effects of the anæsthetic. These temporary sets retain the characteristic expression of the face, which, once lost, is very difficult to restore ; not only so, but they help to maintain the proper articulation, which is very liable to be impaired, if people are without teeth for some months. When the temporary sets answer all the requirements, they should be worn until you are confident the mouth will undergo no further change then a permanent set should be made. It is sometimes a rather difficult matter to persuade patients to have a new plate, as they assert, that they and their friends are perfectly satisfied ; this is hard on the dentist, as he may feel very certain, in his own mind, that there are several points which he could very considerably improve.

THE ACTION OF THE HUMAN SALIVA
ON PLANTS, AND THE PHYSIOLOGICAL
AND THERAPEUTIC EFFECTS OF
SULPHO-CYANIDE OF POTASSIUM.

By Dr. FLORAIN, of Orleans.

AT the Meeting of the Congress of learned Societies, held in Paris in June of last year, Dr. Florain, of Orleans, as member of the Société des Sciences Medicales of Januat, read a short paper on the above subject. The experiments he has made would tend to show that the toxic effects of human saliva on vegetable tissues, which was first pointed out by M. H. Chouppe, is due to the sulpho-cyanide of potassium, one of its normal constituents. Some seeds will germinate in pure saliva ; others develop much more slowly in it ; but whatever may be the growth of the plant it withers and dies very rapidly if the quantity of saliva is sufficient to enable the plant to absorb a few centigrammes of sulpho-cyanide. Identical results were obtained in the case of germinating seeds and fully developed plants : violets, primroses, &c., the stems, leaves, and flowers of the plants suffering from these toxic effects all showed characteristic traces of the presence of the sulpho-cyanide. This salt, which is so very highly poisonous for plants, may be given in rather large doses to animals without producing any ill effects. M. Florain succeeded in causing the absorption of fifty centigrammes of this salt by means of hypodermic injections in a rabbit without the animal being at all inconvenienced by it ; sixty centigrammes will cause diarrhœa, and one gramme is sufficient to kill a rabbit. M. Florain tried the effects of sulpho-cyanide of potassium upon himself. On the first occasion he took ten centigrammes, and followed this up by a dose of twenty centigrammes the following day. The only inconvenience this caused him was a slight feeling of weight in the renal region. Though tolerated in rather large doses by animals it is not quite innocuous as was first pointed out by Wachter. The presence in normal saliva, would tend to show that its object is to prevent in a certain measure the entrance of microbes into the human organism. A study of the physiological effects of this salt might not be without profit for the science of therapeutics.

NON-METALLIC PLASTIC MATERIALS FOR
FILLING TEETH.

By OTTO ARNOLD, D.D.S., Columbus, Ohio.

OF all operations in dentistry, that of filling teeth engages our consideration more extensively than all the rest. With rare exception, the largest part of an intelligent and well disposed dentist's practice is of this character.

There is a natural demand for this class of operations. People reluctantly consent to the loss of their teeth. As a rule they prefer to retain their natural organs if conditions of health, comfort and usefulness can be secured.

This being the case, the question of filling materials becomes an important one for consideration.

Gold and amalgams. The former, as yet, the peerless element for filling; the latter, so much abused and persecuted, but a most excellent compound and second only to the former in honest and skilful hands—these are to-day the only substances in general use, that may safely be called permanent filling materials, excepting platinum and platinum iridium foils which are used to a limited extent and for special purposes only. I shall not further discuss either of these, but confine myself to the non-metallic plastics.

Scientific research and the inventive genius of man have been taxed to the utmost for these many years; in efforts to discover or prepare a plastic substance possessing properties essential to a perfect filling for teeth, viz., adaptability, toleration, preservativeness, sightliness and indestructability; and above all, requiring only a mediocre degree of manipulative ability for its use. It is useless to state, that this ideal filling is yet to be discovered.

To the unsuspecting and susceptible in our profession, many tempting morsels are offered by the numberless preparations in the market claiming to meet all these requirements. Likewise the public falsely are impressed by the euphonious, but misleading adjectives under which most of these sail; for example: osteo-plastic; diamond cement; os-artificial; plastic bone; porcelain cement, etc., etc., *ad infinitum*. Many, if not all, of these preparations, have most desirable properties. Some excelling in one particular, some in another. In the aggregate, they are useful and I may say indispensable; but

as permanent filling materials they are, individually and collectively, failures.

The employment by the earlier dentists of gums, as mastic and sandarac, in etherial and alcoholic solutions for the stopping of cavities of decay, is the first approach history records of plastic fillings. About the year 1848, however, the first substantial progress was made in this direction by the use of gutta-percha as a temporary filling material; this was soon recognized as an important element, and before long came into universal use and favour. A little later the well known compound, Hill's Stopping, was introduced, which is a modification of gutta-percha by the addition of certain mineral elements to make it harder, therefore more available for permanent fillings. This substance filled a long felt want, held its own for many years, and is used to-day by a large class of good operators.

About thirty years ago oxychloride of zinc was introduced, the first of a now well known class of filling materials, viz., the zinc plastics. Next in order came oxyphosphate of zinc, followed by innumerable modifications and combinations, all included in this class, now so extensive that a chronological order of description would weary the most patient auditor.

It is not the purpose of the writer to detail the chemical composition of these products, nor to recommend any special brand, but I propose to speak of their characteristics as a class, their practicability and general value in dental practice at the present time.

It cannot be denied, that the introduction of gutta-percha and the zinc plastics was the beginning of an era in operative dentistry, that made it possible to attain results never before brought about. Prior to that time, little, if anything, had been accomplished in the direction of protecting pulps from the effects of thermal irritation. The solution of this problem alone is of such intrinsic worth as to make any material capable of contributing to that end of inestimable value. All preparations of the zinc plastics, likewise gutta-percha, at least so far as the writer has knowledge, are more or less non-conductors of caloric, therefore valuable for this purpose; and from the extensive knowledge on this subject, it is almost an unpardonable offence to ignore their use in all large cavities as a protection to the pulps. These conclusions are from a practical point of view but with due deference to the experiments with the electric thermostat, which indicates the contrary.

Gutta-percha, however, unless in solution of chloroform or other volatile solvent, is not wholly safe, unless the greatest care is exercised to prevent its introduction into the cavity in too heated a condition. This is a serious obstacle, as the minimum degree of heat necessary to plasticity may, especially if the pulp is near the surface, be sufficient to permanently injure this organ. The pressure generally necessary to adapt this substance to place is another objection. So nothing short of the greatest caution in its use will give certain results. Gutta-percha as a filling material, compared with the zinc plastics for inside use, and amalgam for outer surfaces, has a limited sphere of usefulness. This deduction takes into account our present available facilities for tooth repair and restoration by crowning, and is from the standpoint, if you please, of 1890.

All filling materials are in their nature foreign to tooth material. Therefore, the substance that nearest approximates the latter, in physical characteristics, comes nearest being the perfect filling. In this respect the zinc plastics have as yet the lead. Their ease of manipulation, perfect adaptation without pressure, non-contractibility, freedom from heat, wholesome therapeutic action and hardness, are qualities peculiar to themselves; it seems nothing further is needed to make the ideal filling except indestructibility.

Each of these preparations belongs to either one or the other of two classes, viz., oxychlorides or oxyphosphates of zinc and their possible modifications. The oxychlorides have an escharotic action on organized tissue, which makes them unsafe as nerve cappings per se; but when used in connection with an intervening layer of a non-irritant, they become useful aids for this purpose. They are decidedly antiseptic but readily soluble in oral fluids, and are distinguished as "the most preservative and at the same time the most perishable" of all filling materials. The antiseptic quality is a valuable feature for root fillings, and as these are supposed to be protected from the fluids of the mouth, their solubility in this relation is unimportant.

The zinc phosphates are less irritating in their action on organized tissue, are denser in structure and less soluble in the oral fluids, and, for general purposes, are preferable and in more general use than the zinc chlorides.

Briefly, then, to sum the matter up, what is the value of zinc plastics in dental practice, and to what extent should they be used? The operator being more or less familiar with the

working qualities and merits of these preparations ought to be able to intelligently select the most suitable for cases in hand.

All large cavities should have a layer of this substance intervening between metallic fillings and their deeper portions, if possible, to protect the pulp from thermal irritation. This seems like an uncalled for statement, but the importance of the principle is sufficient to bear emphasizing, for there are some operators, even in this day and generation, who are indifferent in this direction, unless actual exposure of the pulp has occurred. The absence of visible signs of pulp exposure is not always to be relied upon as a guide; then cavities may be so obscurely located that a satisfactory view of their interior is impossible. In view of these elements of uncertainty—where the hazard is great—chances should be reduced to the minimum. As a covering contiguous to exposed pulps, the more neutral and non-irritating of these preparations possess more good qualities than any other substance, chiefly on account of their adaptation without pressure and the non-generation of heat.

For filling root canals zinc plastics are unsurpassed. The method I have practised for a long time, with more satisfactory results than any other, is to carry these to the apex on shreds of cotton of a fineness suitable to the case in hand, using necessarily the non-sticky variety. The facility and greater certainty with which the apex may be reached, combined with the imperviousness and antiseptic properties, make them the ideal root filling. For use in connection with crown and bridge-work, we have nothing to compare with them and can only say they stand alone. For entire fillings in teeth that promise pathological complications, or for obvious reasons require temporary operations, they are a most valuable material. Taking them all in all, they occupy an important place in dentistry, and we could ill afford to return to the methods in vogue before their introduction.

But like all good things zinc plastics are often abused and their use is not always followed by the best results. The grateful sense of comfort, following their introduction into sensitive cavities, affords too great an inducement for their use in cases demanding something more permanent. This property is too often taken advantage of for hastily terminating a disagreeable engagement, rather than subserving the best interests of the patient. For the time being, the patient is satisfied; but when, in a few months perhaps, the filling has

appreciably disintegrated, there is disappointment and a diminished regard for dental principles in general. The operator, who has so little control over his patients that he cannot do thorough work at once in simple but sensitive cavities, will probably accomplish little more at future sittings. I am opposed to temporary fillings as a substitute for something better, except possibly in children's cases, or where pathological or certain sexual conditions prohibit.

But the principal provocation for criticism is the indiscriminate practice of prostituting a good thing for uses other than its proper one. Zinc plastics are used to a large extent for front teeth, and recommended for permanent work under such significant but deceptive names as, bone fillings, porcelain fillings, etc., etc. The outcome of such practice can result only against the general good of the profession through the ultimate disappointment and loss to the innocent victim.

The remedy that suggests itself against such abuse is to be more explicit in imparting advice on these matters. We are consulted as authorities on these subjects by a confiding public; let us see to it that we enlighten them as to the facts of the case and fearlessly uphold the right. When temporary fillings must be inserted impress the patient forcibly as to their limited utility. If such fillings are preferred on account of inexpensiveness, or for any other reason, be emphatic in calling them temporary fillings and nothing more. It is our duty to denounce, in no uncertain terms, all doubtful practices that tend to reflect upon our profession. An exposition of disreputable methods, in vogue for selfish gain, will do no honest person harm; but, on the contrary, so strengthen public confidence, as to work lasting benefit to both patients and conscientious operators, while all doubtful methods will be left to their true sphere—the office of the enterprising advertiser of nostrums and miraculous devices.

PECULIAR AFFECTION OF THE MUCOUS MEMBRANE OF THE TONGUE.

By DR. DINKLER.

A BOY aged eight, who had come under the observation of Dr. Dinkler, presented a peculiar affection during the desquamative period of an attack of scarlet fever, i.e., “a black hairy tongue.” A number of black coloured feathery pro-

cesses developed on the back of the tongue ; they were intimately connected with the mucous membrane and were found to consist of abnormally large filiform papillæ, which had undergone a peculiar change of form. These excrescences remained unaltered for a few days, then gradually became smaller, and lost their peculiar colouration, and ended by returning to the normal size and colour of the filiform papillæ.

Dr. Dinkler met with a similar alteration in the person of a man of thirty, who suffered from slight gastralgia dependent upon catarrh of the stomach with much acidity. In this case, the filiform papillæ of the tongue were surmounted by conical swellings from which sprang a luxuriant growth of bacilli of apparently similar morphological characters. A third patient also presented similar changes in the mucous membrane but to a more limited extent, and with the difference that these hair-like growths would at times become more prominent, and then seem to dwindle again. This patient was suffering from some subjective symptoms after an accident. These cases were thus two clinical manifestations of different affections of the mucous membrane of the tongue, one of which was characterised by the presence of yellow hair-like prominences, whereas in the other the dark black feathery outgrowths were of quite a special nature. The special feature in both affections was an abnormal growth and lengthening of the filiform papillæ. All three cases rapidly recovered without any kind of treatment.

Reflections from the Surgery.

AN UNUSUAL CASE OF ABSORPTION OF THE ALVEOLAR BORDER, WITH LOSS OF TEETH.

By H. FIELDEN BRIGGS, D.D.S., L.D.S., House Surgeon,
Liverpool Dental Hospital.

J. S. æt. 16, printer's apprentice, was brought by his mother for advice under the following circumstances. Ten months previously his upper right canine was extracted for "tooth-ache," the remainder of his teeth then being present, and sound. Since that time the whole of the alveolar border, from the right upper second molar to the left upper canine, has been

absorbed, and the eight contained teeth have been ejected in an apparently sound condition.

He had no pain during their loss, nor was his general health deranged. He sought advice by reason of his having no upper teeth with which to masticate.

On examination, the gum was found spongy, and the left upper canine and first bicuspid were held in place only by a mass of spongy gum. There were no signs of pus, no pain, and but little redness. His lower teeth were all sound and the gums perfectly healthy. In general appearance, he was somewhat pale and on the left side of the neck was a very small lump, but otherwise the lymphatics were not enlarged. Both tonsils were hypertrophied. His five brothers, father and mother, have all had, and continue to have, good health. The cause of the trouble seems obscure but may possibly find its explanation in scrofula. After the gums are rendered firm, artificial teeth will be inserted.

A CASE OF NEURALGIA :—Mr. Schmidt of Liebeck reports, in the "*Deutsche Monatsschrift*," a case of severe neuralgia of some months duration, paroxysms being caused by the slightest pressure on the Infra-orbital region. Sleep could not be obtained except by the use of morphia. The upper jaw was edentulous, a full upper denture being worn. No roots were apparent, but on the right side a fistula was seen, at the bottom of which a probe distinctly felt a rough point. No wisdom tooth had been cut. The fistula was plugged with Iodoform cotton-wool to enlarge it. This treatment was continued for four weeks when the fistula was sufficiently patulous, to seize with bayonet forceps a stump which lay in the Infra-orbital region. As, when the patient was first seen, this was in the region of the wisdom tooth, it must have moved a considerable distance, and in so doing have probably injured the nerves there situated. Dr. Schmidt suggests, that this travelling may possibly have been due to the movements of the cheek muscles.

British Journal of Dental Science.

LONDON, APRIL 1st, 1890.

NON-REGISTERED "DENTISTS."

IN another column we notice the case of Arnemann, the German (so-called) Dentist, who has been guilty of shooting Judge Bristowe, and sentenced to twenty years penal servitude. Now, really, the case has no more special interest to us, than any other charge of assault. He was not a Dentist, for he was not registered, and had no more legal claim to the title, than, say a shoeblick, who, without training of any kind, should to-morrow take it into his head to tinker with the crossing-sweeper's tooth. Yet not only is this man called "Dentist" in all the daily papers, but he is actually described as such by the prosecuting counsel, who, in such a case, are instructed by the administrators of the law of the land. For the Act of 1878 distinctly states that ; "A person shall not be entitled to take or use the name or title of "Dentist"..... unless he is registered." Now, what was the *fons et origo* of that Act? Was it to create a kind of monopoly for a limited number of men, who should enter the dental profession through the portals of the various Colleges? Does anyone suppose, that this would have been a lever strong enough to get such a bill through our already overworked House of Commons? Does anyone suppose, that the men who energetically "backed the bill," would have lent their support, had such been the motive? No! its Alpha and Omega was to protect the public. To ensure that, if a patient should go to to a man calling himself "Dentist," he should at least be sure he is going to a duly qualified man. But has the act brought

all this about? Not yet, and the reason is not far to seek. For although it is a public law for the benefit of the public, its enforcement is left to the Profession itself, and then, forsooth! when it endeavours, however imperfectly, to do for the public what the public should do for itself, one hears whispered "Professional Jealousy," or similar phrases. We are, however, not alone in this matter. The medical profession is with us. It has, indeed, been said, that the only use of a Medical Diploma is to render a man liable for the pains and penalties of true, or alleged malpractice. Surely it is not too much to ask, that when a man either announces to the public, that he is, what he is not and if (though his front door be only decorated by his name), he practises what he has no right to practise; even though he escapes the letter of the law by calling himself "Bone-setter," or any similar name; surely, we say, it is not too much to ask, that he shall be brought to book for so doing, prevented from continuing to do so, and this, not through the medium and at the expense of "The Profession," but by law officers appointed and paid for by the public. That the man should be a foreigner seems to us to strengthen this need. We only too gladly welcome any, if they be but "good men and true," but one cannot feel much sympathy for any man, who, of his own free will and choice, comes to dwell amongst us, and then treats the laws of our Profession with defiance, or ignores them altogether.

Dr. W. R. SMITH, F. R. S. EDIN., Professor of Forensic Medicine, King's College, London, has been appointed Medical Officer of Health to the School Board for London, at a salary of £400 per annum. The advertisement stated, that the officer would be required to give his whole time to the duties. Commenting on this the *Lancet* says:—"We now learn that a gentleman has been appointed, who we cannot believe will abandon the other offices he holds, among these being that of medical officer of health. The School Board therefore must have altered its intentions as to the duties which must devolve upon the officer, and must have departed from the advertised

condition, that no other appointment was to be held by their officer. The point, we desire to emphasise, is the impropriety of a public body altering the terms of an advertised appointment without the reissue of an advertisement." We thoroughly agree with our contemporary, but recently, a dental appointment was advertised, the candidates being required to possess the M.R.C.S. or F.R.C.S. But lo! and behold! when the successful man was announced, he was found to be but an L.D.S.I. Now, it is quite possible L.D.S.I. may have been the very best man under each and every circumstance, but it can also at least be understood, that men, who would have entered the lists, but for the above stipulation, should feel somewhat aggrieved.

The question of degrees for London Medical Students is again upon the carpet. The proposal now to the fore is one on somewhat the following lines. A man, who has passed the "Matric." and "Pre. Sci." of the University of London and taken the "double" shall be allowed, after a suitable period of hospital or private practice, to present himself for the pass M.D.

WE learn from a letter of Dr. D. Genese to the *Ohio Journal of Dental Science* that a "patent has just been granted" on a mixture of wax and shellac used for base plates. The thing has been known and used for years, in scores of work-rooms, and has been placed in the market by Ash & Sons, as indeed Dr. Genese points out. Reading announcements of this kind makes one begin to doubt, whether our friends across "The Pond" are actually so very much "first and the rest nowhere," as they would have us believe. We suppose it is not possible that those "at home" are not so far ahead as those who have honoured us by their company? Or, perhaps, the latter have picked up "a thing or two" over here. Anyway, after this, we are quite prepared to read of "a patent being granted" for a mixture of plaster of Paris and water for casting models, or any of the other

things, which our grandfathers and our grandmothers taught us. Dr. Genese's objection, as to the difficulty of cleaning this mixture away from the teeth before packing in the vulcanite, does not apply, if it be simply used as a thin base plate, the teeth being fixed to this and the contour built up by ordinary wax.

REPORTS and notes of the recent Influenza Epidemic are now flooding the medical papers. It is to be hoped all this will lead to some reliable information on the subject. The treatment adopted seems to have been very various. Some give camphor to smoke. In Paris a more pleasant remedy of beefsteaks, claret and champagne is ordered, whilst a "well-known physician" recommends a milk diet as a cure. *Apròpos* of which the *New York World* prints the following 'wheze' as the word 'influenza' was coined, because the influence of the stars was thought to cause the disease, it is appropriate that a milky-way to a cure should be found."

EVERY-ONE knows how common the use of eye-glasses is in Germany. The charitable put it down to "much study." The uncharitable to "foppishness." Dr. Forester, Director of the University of Ophthalmic Clinique at Breslau, states : that in 300 cases suffering from a chronic complaint, he found this to be due to interference with the normal blood supply, by wearing tight collars.

NOT AT ALL A BAD IDEA is that adopted by Dr. Talbot, in having his paper printed and sent to the members before he read it to the First District Dental Society of the State of New York. How can a man a few minutes after listening to a paper read through once, perhaps more or less indistinctly, be prepared to give his opinion on the theories, etc. therein mooted? How can he call to mind all the cases and points bearing on the subject? We would suggest the idea to anyone, who wishes his paper to be followed by a good discussion. Certainly it followed Dr. Talbot's paper.

But what did the member mean who said :—" When a man says a thing is so, and that he can prove and demonstrate it, then we have something positive ; but when he simply attempts to tear down theories that have already been accepted, and gives us nothing in their place, that is not instructive." Does he prefer a false theory to no theory?—That a theory has " already been accepted," won't bolster it up for long, if a single fact be hurled against it. Still it is very difficult to admit that " we do not know."

THE VALUE OF COFFEE AS A MICROBE DESTROYER :—In some experiments upon the dietetic and food value of coffee, Herr Luderitz has tested its behaviour towards pathogenic and non-pathogenic bacteria. He reports, that he found all the bacteria experimented on to be retarded in their development in nutritive gelatine by relatively small quantities of aqueous infusion of coffee (10 g. coffee to 90 g. water), but the power of resistance manifested by the different species varied. Caffeine seemed to possess some antibacterial power, but it was so slight that its influence in the action of infusion must be inconsiderable. It is rather to the empyreumatic substances formed in the roasting of the coffee, which have been termed collectively " caffeon," that Herr Luderitz attributes the essential antibacterial action. In commenting upon this note the editor of the *Pharmaceutische Centralhalle* recalls the fact, that fresh raw meat enclosed in the powder of roasted coffee can be dried without the least appearance of putridity. The facts here adduced are of interest in connection with the fact, that finely powdered coffee mixed with iodoform destroys the nauseous odour of that drug and does so apparently without diluting its asepticity.

MECHANICS being, or should being the Dentists' " fort;" he will take a more than passing interest in the greatest mechanical feat of the age, the Forth Bridge. Much as we appreciate the details, etc., given in the excellent special number of the "*Engineering*," it is difficult to realize the magnitude of the work—Two points culled from morning papers may help one. Stand on Waterloo Bridge. The longest span would stretch from Charing Cross Terminus away over our heads to Somerset House. Let the Embankment represent the bed of the Firth, and you could stand St. Pauls, cross and all, under the arch.

Manipulative Miscellany.

All new instruments or articles wished to be described under this heading are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

LISTERINE.

Messrs. Lambert & Co. of St. Louis, send us a sample of what they describe as "the best antiseptic" viz: Listerine. This is not a simple preparation of any one drug, but a compound of many, among which, however, both as to taste and odour, Thymol stands pre-eminent; although its antiseptic value largely depends on Boracic Acid. Of value internally and externally, as many competent observers have already attested, we wish only to note its uses in our speciality. Possessed of none of the escharotic properties of carbolic acid, it is of course of no use simply as a tooth dressing to obtund pain, nor of much as an antiseptic dressing, for as a simple antiseptic agent it is vastly inferior to Perchloride of Mercury, the relative proportion being 1 in 100,000 and 1 in 20. When, however, we consider what is wanted in a mouth-wash, quite a different condition of things is shown. Here Hyd. Perchloride is ordered only with reluctance, on account of its poisonous properties; Carbolic acid because of its disagreeable odour and the peculiar shrivelled up condition of the gums it produces; Pot. Permang., because it stains so. Listerine seems to be free from all these objections—of a pleasant odour and taste, harmless if swallowed, and withal, as Miller points out, noteworthy for the rapidity with which it acts on fungi. Time alone will give it its proper place in our "Materia Medica," but it is certainly indicated in discharging alveolar abscesses, pyorrhœa alveolaris, stomatitis, as an antiseptic mouth-wash for general use and as a disinfectant and purifier of artificial dentures.

UNIVERSAL SEPARATOR.

Messrs. Hallam & Son send us a perfected "Universal Separator" in which they have removed some of those defects we felt it our duty to point out in a recent issue.

Abstracts of British & Foreign Journals.

MEDICAL AND SURGICAL REPORTER.

EXTRACT FROM CLINICAL LECTURE—PRIMARY DENTITION.

By Dr. LOUIS STARR, M. D.

PRIMARY dentition is usually performed between the fourth and thirtieth months. The teeth in this set are twenty in number, and are cut in groups, a period of rest occurring between the eruption of each group. The first teeth to appear are the two central incisors of the lower jaw, usually at the sixth or seventh month, though at times as early as the fourth. Then there is an interval of from three to nine weeks, followed by the eruption of the second group, the four incisors of the upper jaw, between the eighth and tenth months. This is followed by an interval of from six to twelve weeks, when the third group appears, the two lateral incisors of the lower jaw, and the four first molars, between the twelfth and fifteenth months. After a rest of twelve weeks, the fourth group appears, the canine or eye and stomach teeth, between the eighteenth and twenty-fourth month, and this is followed by a period of from four to twelve weeks before the appearance of the fifth group, the four last teeth or posterior molars, by the thirtieth month. The period of rest is a very necessary and important one. During dentition there is a disturbance of the whole system, and should all the teeth be cut at once the child would be made very ill. Therefore this period is required for recuperation. The normal plan of eruption may be deviated from. The teeth may be cut too early. Cases are met with in which the first group of teeth was present at birth, while it is not unusual to see them by the fourth or fifth month. Nor is this an unfavourable circumstance, for an early dentition is usually an easy one. It is more apt to occur in children fed from the breast, and in girls than in boys. Next, dentition may be delayed, and the first teeth not appear until the eighth or ninth month, nor the last group before the third year. This delay in dentition should always bring up the question of rickets. It is more apt to occur in bottle fed babies. Again, the teeth may be cut irregularly, the groups

not appearing in their normal sequence, or a number may appear at the same time. Delayed and irregular dentitions are both apt to be hard, and to give rise to certain symptoms of disease. The teeth most apt to give trouble are the third and fourth groups, but it is a fact that if one group causes a great deal of trouble, the remainder are apt to be cut without difficulty. The symptoms attending dentition are as follows : When you examine the jaws of a child, in whom the teeth are not advancing you will observe that the gums are of pale pink colour and have a well marked ridge-like margin. When the teeth advance this ridge disappears, the gums become swollen, reddened, and moderately hot and tender to the touch. There is some increased salivation and the gum is the seat of moderate pain. These features of the normal process continue until the tooth pierces the mucous membrane, but are never so severe as to cause any disturbance to the child. In difficult dentition all of these normal symptoms are exaggerated, so that we may have catarrhal or aphthous stomatitis, with pain, fever, loss of appetite, and general malaise. Other local conditions are ulceration on either side of the *frænum linguæ* from friction, from the sharp edges of the lower incisors and profuse salivation. The latter condition is an important one for it may lead to so much wetting of the garments as to produce and maintain a severe bronchial catarrh, which, by the way, is apt to resist medical treatment unless the clothing is kept dry by a bib of oil silk or rubber cloth. The general conditions attending difficult dentition are enlargement of the lymphatic glands at the angle of the jaw, certain eruptions upon the skin, especially eczema, strophulus, and urticaria ; vomiting, diarrhœa, infantile convulsions, so-called dental paralysis—the latter being probably a condition of anterior polio-myelitis ; blenorrhœa and otorrhœa are also common complications. Not only are the teeth advancing but the follicular apparatus of the stomach and intestinal canal is undergoing development in preparation for the digestion and absorption of mixed food, the cerebro-spinal system is rapidly growing and functionally very active, and the organs and tissues of the whole body are in a state of rapid change. This period of normal transition must also be one in which there is great susceptibility to disease, provided there be a casual influence at work. Whichever of the above symptoms may be present, appropriate medical treatment is of course indicated. He believes in the propriety of lancing the gums over advancing teeth so as to thoroughly free them and do away with

backward pressure and consequent irritation of the delicate nervous system. One should not wait until the gums are soft and swollen and until the edge of the tooth can be seen through the mucous membrane, but should cut freely down, so as to divide the denser layers of the gum and connective tissues whenever any of the complications are present, and examination of the gums shows advancing teeth. The operation is never properly performed unless the edge of the lancet can be felt to grate against the tooth. The incision over incisor teeth should be linear, over the canines rectangularly crucial, and over the molars obliquely crucial.

DENTAL COSMOS.

IRREGULARITIES.

Dr. Talbot.—This summer I examined the mouths of five thumb-suckers at the sea-shore. Two boys, twins, twelve years old, and a girl of nine, belonged to the same family. The boys had sucked their thumbs from birth, discontinuing at seven, probably from shame. The mother informed me that in each case the thumb of the right hand was inserted into the mouth with the palmar surface toward the tongue, producing pressure upon the teeth. These boys were strong and active, their jaws well developed, the vaults of medium height, the dental arches normal. The girl was gradually discontinuing the habit. She had also sucked her thumb from birth and held it in the same way. Another child, a girl of five, showed a slight forward movement of the right temporary central incisor, which could only be noticed on close inspection. The last case was that of a boy four years of age, who was sucking his thumb most of the time. He directed the palmar side of his thumb toward the upper alveolar arch. The pressure thus produced resulted in a slight absorption of the alveolar process, while the contour of the arch and the position of the teeth were perfectly normal. In none of the cases cited were the permanent teeth irregular.

The theory that the pressure of the buccinator muscle in sleeping with the mouth open is the cause of contracted arches

is incorrect, (1) because it is inconsistent with our knowledge of the influence exerted by muscular structures on the osseous system in other parts of the body ; (2) because muscles do not contract sufficiently to produce the necessary pressure ; (3) because by such pressure exerted on both sides of the arches semi-V- and semi-saddle-shaped, partial V- and partial saddle shaped arches would be out of the question, and (4) the lower maxilla would be modified as much as the upper.

Dr. N. W. Kingsley.—When I see a very large and prominent upper jaw which belongs to a family type, and it seems desirable to reduce that jaw, there is not much use in attempting it with the expectation that it will remain. We may be able to reduce it by taking out the first bicuspid on each side and carrying the incisors back, and we may hold them by appliances for two, three, or five years, but I will wager that in ten years from the time we take off the appliance the upper jaw will have substantially, if not identically, the same expression that it would have had if we had never attempted to change it. This is what I mean by saying it is useless to interfere with a fixed family type. This argument would not apply to the lower jaw. There are many cases where the lower jaw is retreating and underhung, which are of an inherited character, a family type ; and if we take a child in hand early enough, having that peculiarity, it can be corrected and it will stay corrected.

Dr. W. C. Barret.—I now have in my hand the skull of a troglodyte, a female gorilla. It is asserted, as you know, that caries in the teeth is attributable to improper habits of life, and the artificial preparation of our food. In this gorilla there are on the approximate surfaces of the central incisors most indubitable cavities of decay. There is more than that. The anterior root of the first superior molar—the sixth-year molar—is entirely denuded, and these two lower incisors are quite badly decayed; and alveolar abscess had supervened. Opposite the root of the right inferior first molar are the marks of an extensive alveolar abscess. Also on the inner side of the right inferior molar is a large territory which has been denuded, and a pocket, which has been formed by *indubitable pyorrhea alveolaris*. It was a wild animal.

ITEMS OF INTEREST.

GALVANO-PLASTIC CROWNS.

Dr. Wm. H. Steele describes his method of preparing the above. Make a two-piece plaster mold of a natural or porcelain tooth of the required size. When dry, tie the two parts firmly, oil thoroughly, warm slightly and pour in melted beeswax mixed with one twentieth of its weight of flake white. (This is best prepared by just melting the wax and then mixing in the flake white, pour on a plate, then re-melt.) The next morning remove the wax model and fit it to bite, using a wax spatula. Leave it as much too long as you wish the crown to go down on the root. Trim it exactly to the shape and size of root. Since the crown will be deposited outside the pattern, this should be slightly smaller than the space it is to occupy. Use a "Daniell" or a "Smee" battery. Next, slightly warm the negative wire, and press it into the neck of the tooth pattern, being careful not to let it prick through to the masticating surface. When cool, make the electrical connections between the wire and pattern continuous by black leading the point of junction thoroughly, bending the wire in this shape Ω . To operate the Smee, the sulphate of copper solution is put in a separate glass jar. The battery is charged with dilute sulphuric acid. Be careful that the screw posts, wires, and rods that come in contact, are kept clean and bright, or the battery current will be greatly enfeebled. Suspend the pattern from one of the rods, by the wire from the battery zinc. The wire from the platinized silver is connected to the other rod, and a piece of copper, twice the size of the article to be plated, must be suspended from this rod. The copper plate and pattern should be hung in the copper solution in a position exactly facing each other, and about one inch apart. When the copper is thick enough, remove from the bath, and clean *thoroughly* by washing it in clean soft water. The pattern is now ready for the gold deposit. Exchange the jar of copper solution for one of gold; remove the copper anode and put in its place one of gold, the same size. It will take from twelve to fifteen hours; the time will depend on how well the battery works, and the thickness of the crown; but as it only requires

occasional attention, the time is of little consequence. When the gold is thick enough, remove from the bath, wash, buff, and polish. When finished, hold the crown in hot water until the wax pattern melts and runs out of the gold shell; the crown is ready to fit and mount.

Battery Solution.—The acid solution for exciting the zinc is one part sulphuric acid with twelve of water, add the water last, and pour slowly.

Copper Solution.—Pour a pint of boiling water on a pound of sulphate of copper; stir with a glass rod, to dissolve as much as possible of the salt. When perfectly cold, pour off the blue liquid, and add to it one-fourth its bulk of the dilute sulphuric acid which had been prepared for the battery. The latter increases the power of the solution for conducting electrical currents. It is much cheaper to buy the gold solution of some dealer in electro-platers' supplies.

THE LONGEST TOOTH :—Yes, I have a canine tooth, larger than Dr. Thatcher's, that I extracted for a gentleman a few days since. It is one and five-sixteenths inches in length and one inch in circumference.

In 1882 Dr. Jackson and I extracted an upper canine, for a gentleman, measuring over one and a half inches. (It required our united strength to remove it.) Next!

L. M. RAUB.

I notice some large teeth in December *Items*. I extracted a right upper cuspid, two weeks ago, which measured one and three-eighths inches in length, and one and one-eighth inches in circumference. And yet the tooth is not of its full length, as a cusp is worn off at least one-sixteenth of an inch.

BASCOM BLACK.

SUPERNUMARIES :—I see in the January *Items* a report of a case of a young lady who has five well developed incisors and the question is asked, Are there many such cases on record? I think not, though I have a model of a young man's mouth, aged 27, with six perfectly developed incisors, and the teeth are in no wise crowded. It is the only case I have ever seen in thirty years practice.

J. E. BRUDING.

BRITISH MEDICAL.

At the Manchester Medical Society, on March 5th, 1890, Mr. M. A. Messiter showed an Upper Jaw that he had removed from a woman, aged 40. Four years previously she had some nasal polypi removed. Eighteen months ago she complained of pain and neuralgia of the right side of the face; this increased, and when seen in October, 1889, the right side of the face was protruded, the right eye was prominent and turned outwards, the nostril and nasopharynx were blocked, and the antrum was perforated anteriorly. The superior maxilla, together with the tumour, was removed, the latter being attached to the base and pterygoid plate of the sphenoid and growing forward into the antrum. Mr. Messiter pointed out the difficulty of distinguishing fibroid from sarcomatous growths in the nose; the latter, however, generally grew from the ethmoid or sphenoid. He regarded the prognosis as good unless there was perforation of the antrum. On section the growth was found to be a fibrosarcoma: and the patient so far had done well.

GRAFTING WITH A GREYHOUND'S SKIN.

Mr. Alexander Miles, M.B., reports a case of grafting the skin of a dog on to a boy's leg, in the *Lancet*, which was shown to the Edinburgh Medico-Chirurgical Society, Dec. 4th, 1889. A boy, aged 10, had slipped and plunged his leg into a boiling mixture of cow's food. The boot protected the foot, but all the leg to the knee was scalded. He was treated with household remedies at home for a month, but on May 24th, 1889, was then seen by a doctor, and sent to the Royal Infirmary. All the skin of the leg was destroyed from the patella to the ankle, except an islet over the shin, but the surface was covered with healthy granulations. A few sloughs were brought away by use of boracic fomentations, and as enough human skin could not be obtained, it was decided to use that of a young greyhound. On June 6th, the grafting operations commenced. The puppy having been killed with chloroform, I closely shaved the whole of the anterior abdominal wall and flanks, and then dissected up the flap of skin thus mapped out. The whole thickness of the true skin was taken, leaving the subcutaneous fat. Mean-

while the leg had been thoroughly cleaned by the nurse, and all bleeding from the granulations arrested. The skin taken from the puppy was cut into strips measuring about six inches long by half an inch broad, and firmly pressed into the ulcer in the long axis of the limb. Smaller grafts about an inch square were used to fill in spaces left between the larger ones. A considerable area over the inner side of the knee still remained bare, and to cover it the skin from the pup's tail was dissected up, unshaved. The dressing consisted of small pieces of protective applied next the grafts, with the edges overlapping to facilitate removal, as well as the escape of discharge, and outside this a few layers of unprepared gauze moistened with weak boracic lotion; the whole dressing being kept moist by a layer of gutta-percha tissue. Over all a good layer of corrosive wool and a firm bandage were applied. The dressings were not changed for three days. After this, some of the long strips sloughed, but the smaller ones did well. A few grafts of human skin were scattered in the gaps. Pieces of frog's skin were tried, but failed. March 10th, 1890.—It is now over seven months since the patient was last under treatment, and the leg is now as useful as ever it was. There is absolutely no contraction in the cicatrix, except where the tail skin was planted, and there it is very slight. The colour of the skin is uniform and very similar to that of the normal skin. There is no evidence of any development of hair or of cutaneous secretions. The ordinary sensation is as good as in the other leg, and the temperature of both is the same.

SOAPS. Dr. B. H. Paul in the *British Journal of Dermatology* contributes an interesting article on Soaps.—He points out, that free alkal has a caustic and irritating effect upon the skin. An examination of 17 samples, representing the products of all the principal manufactures of high class toilet soap, showed that in five of them the proportion of soda to fat acid was nearly that indicated for a neutral soap, but that in some of them there was also potash present, the greater part of which would be uncombined with fat acid, and communicate to the soap an abnormal alkalinity. The general result went to show that among toilet soaps, as usually met with, a perfectly neutral soap is the exception, and that a trustworthy soap of that kind is still a desideratum.

DISCUSSION ON ANÆSTHETICS AT
THE MEDICAL SOCIETY.

Dr. Lauder Brunton delivered a very interesting address on his work at Hyderabad, at the Medical Society on Monday evening. Describing the methods he employed, now pretty familiar to those who have pursued physiological research, he passed round a number of tracings illustrative of the fall of blood pressure under chloroform, &c. Dr. Brunton reiterated, in the main, the conclusions which have already appeared in our columns, says the *Lancet*, but supplemented them by details of work, which could hardly find a place in the formal report. The discussion to which Dr. Brunton's singularly lucid descriptions gave rise tended to indicate conclusions not altogether in harmony with the Hyderabad Commission's results. While admitting the force of Dr. Brunton's arguments as applied to the lower animals, the practical anæsthetists present deprecated the extension of conclusions from the lower animals to man, unless positive evidence of uniformity of behaviour of chloroform towards men and beasts were adducible. It was further pointed out, that the evidence produced was, so far as the action of the drug upon the heart went, wholly negative, and that the clinical observations of Snow, Clover, and living anæsthetists were opposed to the Commission's contention that chloroform kills through the failure of respiration, and not by primary heart failure. While conceding the obvious and great value of experiments made upon the lower animals to elucidate conditions prevailing in man, one of the speakers pointed out that considerable divergence in reaction towards chloroform existed in them, and this was an additional reason for not relying too much, in the present discussion, upon the negative evidence Dr. Brunton advanced. None will seek to diminish the great value, both scientifically and practically, of Dr. Brunton's painstaking researches, and it must be accepted as a sign of respect to him that so eager and lively a discussion was elicited by his description of his part in the work of the Hyderabad Chloroform Commission.

DENTAL ANOMALY EXTRAORDINARY.

Under this heading a correspondent of the *Cosmos* describes a case of interest. A young lady, of about eighteen

years presented a case in which the inferior teeth were normal in number less, the third molars, and were regular in character, arrangement, and articulation. From the superior maxilla, somewhat more than a year previous to her present appearance, November 15, 1889, I had extracted the badly decayed first molar of the right side. Without any artificial aid, the second molar came forward against the bicuspid and the third molar erupted in the place of the second. At that time the place of the left cuspid was vacant, but a decided prominence was noticeable in that region, and there was ample space for its hoped for, though very tardy, eruption. There ensued, however, a local disturbance which led her to seek relief, and she readily consented to the extraction, which was advised, as the only then feasible mode of meeting the indications. Much difficulty was experienced in removing the tooth, which offered remarkable resistance to traction in the usual directions : but as it seemed in some degree yielding to outward pressure, a combined right rotatory, with a down and outward pull, brought away safely the most surprising dental anomaly that I have seen in the course of many years' practice. The specimen itself must be inspected to gain an adequate idea of the anomaly. There appear to be two bicuspid, the roots of which are reversely everted and gemmated, or blended, while the two crowns are united in reverse opposition. Not the least remarkable fact is the removal of the mass without any considerable loosening of the normal-appearing bicuspid, under which the anomaly lay. The model is from an impression taken five days after the extraction, and shows on that side nothing more unusual than would be apparent after the extraction of an ordinary cuspid. The operation afforded immediate relief, and the remaining bicuspid, without intermission, capable of painless service in mastication. The history of the patient and her family discloses no variation from a type of remarkably uncontaminated and robust healthfulness. Heredity seems, therefore, to be out of the question in an effort to discover a probable cause for this extremely singular aberration. The specimen will, however, be subjected to expert inspection with the view of, so far as possible, making a complete record of the case.

Reports of Societies.

STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

ORDINARY GENERAL MEETING held Monday, March 10th, at 8 p.m. Leonard Matbeson, Esq., President, in the Chair.

The minutes of the previous meeting were read and confirmed.

Messrs. Dodd and Walton were balloted for, and elected members of the Society.

Messrs. Taylor, Richard, and Jones were proposed for membership.

On Casual Communications being called for, Mr. Briault showed an improvement on the Universal Separator exhibited by Mr. Barrett at the last meeting. The blades of the instrument instead of passing one above the other, passed one behind the other, and thus allowed more space at the cervical edge of the cavity.

Mr. Coysh presented to the Society models of the mouth of a patient aged five years. These showed complete suppression of the upper temporary centrals and laterals.

The President then called on Mr. Schelling for his paper on the Use of Gold in Dentistry. (See page 289).

The discussion was opened by Mr. Bull, who thought Mr. Schelling had not given justice to gold cylinders. Mr. Bull was of opinion that, if cylinders were properly inserted, as good a filling could be made as when foil was the form of gold used. A very good way of starting a large filling was to floor the cavity with an osteo filling and put a gold cylinder, or piece of foil in the osteo before it set. This formed a base on which to build the filling. He had found that some patients rather preferred a gold filling to show in the front of the mouth than otherwise.

Mr. Harsant thought that some of the time that had been devoted to describing the manufacture of gold foil might more profitably have been given to the use of gold in connection with other metals for filling purposes. The combination of gold and tin made a very durable filling, and one that was easily put in. He had used one sheet of tin between two of gold. These were folded and twisted into rope, the

rope being packed in non-cohesively. Shortly after insertion, the filling becomes exceedingly hard, though it gradually turns dark.

Mr. Preedy could quite endorse what had been said as to the virtues of tin and gold fillings. The only objection was the colour, which was like that of tin amalgam. He would like Mr. Schelling to explain why the curious hardening took place in these fillings. He thought that the students of the Hospital ought to give more attention to the use of non-cohesive foil than was usually the case.

Mr. May had always found that patients did object strongly to gold showing in the mouth. Wherever it was possible, cavities should be cut out from the back, so as to leave as much of the front wall of the tooth as was still standing. He had examined some Herbst fillings done out of the mouth, and had found them by no means well condensed, but distinctly granular.

Mr. Woolf had found as good results from using cylinders as from tape. He would therefore advocate the use of cylinders. He believed the work could be done quicker in that way.

Mr. Longhurst advocated the use of burnishers in finishing of cohesive fillings. He had found it possible by this means to work the gold well against the edge of the cavity thus avoiding any possibility of the filling leaking.

Mr. Gask thought that one of the advantages of non-cohesive fillings was lost by men not using cylinders large enough. By this, the great saving in time, which should be secured by the use of large pellets, was lost.

Mr. Rilot did not wish to go into the question of the superiority of cohesive or non-cohesive gold. He would point out one thing, however—that any defect in a cohesive filling would probably be at the edge of the cavity, while any fault in a non-cohesive filling usually occurred in the centre of the gold. This was a fact distinctly in favour of the latter class of work, especially as none of us were perfect, and defects would occur occasionally. He thought, that where the four walls of a cavity were standing it was easier to put in a non-cohesive filling than a cohesive one. He had heard the epithets “hard” and “soft” applied to gold. He could not too strongly object to this misuse of words. All gold should be soft before use, and all fillings should be hard after insertion. He regretted that the contrary was sometimes the

case. He thought Mr. Schelling was quite right in confining himself strictly to gold.

Mr. J. F. Colyer was of opinion that the use of cylinders or tape depended in the main on the skill of the operator. He considered, that the use of cylinders required more skill than the use of tape. He denied that it was quicker to work with cylinders than with tape. If thick tape were used instead of cylinder the saving in time would be considerable. He did not think any good could be done by burnishing a cohesive filling. If properly condensed the burnisher would not have any effect.

The President thought that those at the Hospital should make time a secondary consideration. The primary object should be good work, quickness would come later. He advocated the use of hand pressure for cavities difficult of access, such as distal cavities in molars and bicuspid. All filling of front teeth should be done from the back so as to show the gold. This was greatly facilitated by the use of suitable instruments and hand pressure. Gold should not be used for crumbling chalky teeth, nor was it advisable to employ gold for patients under about 15 years of age.

Mr. Schelling then replied to the various speakers.

The usual vote of thanks was passed to Mr. Schelling for his paper, and to the gentlemen who had brought forward Casual Communications.

The President then announced that the next meeting would be held on May 19th, when Mr. A. C. Gask would read a paper on "Cocaine."

The proceedings then terminated.

Dental News.

THE BERLIN INTERNATIONAL MEDICAL CONGRESS.—DENTAL SECTION.

It is proposed that on Monday August 4th, there shall be a General Meeting of the Section. That from Tuesday August 5th, to Saturday 2th, there shall be clinics every morning from 9 to 1 o'clock, in the Institute der Königlischen Universität, where there will be accommodation for 15 chairs.

In the afternoon, 2 to 5 o'clock, papers and discussions. So far, the papers arranged are :

1. Bromide of Ethyl, by Dr. Hollaender.
2. Pyorrhœa Alveolaris, by Dr. Magitot.
3. Microorganisms in Caries, by Mr. J. H. Mummery.
4. Crown and Bridge-Work, Dr. Barrett has been asked.
5. The Bonwill Articulator, Dr. Bonwill has been asked.

It has been decided that Dentists possessing a state recognised Diploma will be admitted members of the Congress—though article II only mentions medical men. The Diploma must, however, be of that country of which he is a citizen ; hence an Englishman with only an American Diploma, is not eligible or *vice versa*.

THE EDINBURGH DENTAL STUDENTS have just brought a most successful session of their Society to a close. At the outset, one of the Honorary Presidents, Mr. Mackintosh, delivered a thoughtful address, brimful of advice to the Students and their office-bearers. The Papers, of which two were read at each ordinary meeting, were mainly contributed by present students. Each paper was discussed, the younger members being encouraged to say something anent each subject, and as a result, nearly every student took an active part in each debate. At the closing meeting, the following office-bearers were appointed to carry on the work next session : President, Mr. John Turner, L.D.S. ; Vice-Presidents, Mr. Frederick Page, L.D.S., and Mr. Herbert Ezard, L.D.S. ; Treasurer, Mr. Douglas Shepherd ; Secretaries, Mr. Murray Thomson and Mr. Simmons.

The Quickett Microscopical Club and the Royal Microscopical Society have removed to 20, Hanover Square.

Dr. F. H. Gardiner narrates the case of a man who, when a boy, had placed a temporary cuspid tooth in his ear, it had remained there 21 years and had given no trouble.

The "Reichs-Medicinal Kalendar" states, that in 1888 there were in Germany 16,864 medical men, and 514 dentists among 46,840,587 inhabitants.

A dentist 95 years old, in Rockland, Maine, is in extreme poverty. To prevent his being taken to the almshouse, T. E. Tibbetts, of that town, asks remittances to give him support for the few remaining days he has to stay on earth.

A "Dalziel" telegram from Berlin announces that:—The Secretary of War has asked the German Dental Society, whether, in case of war, a corps of surgeon-dentists, for service in the field, could be secured at immediate notice." Now that the Germans have taken a practical step, our authorities will perhaps begin to consider the matter not altogether beneath their notice.

SINGULAR DEATH OF A DRESSMAKER.—An inquest was held at Manchester, concerning the death of Alice Maud Mary Uplin, aged 20, a dressmaker. On the 20th of September, the deceased was eating her dinner, and suddenly exclaimed, that she had swallowed a portion of her artificial teeth, and that it was lodged in her windpipe. Her mother at once took her to a doctor, who failed to remove the detached teeth, and he recommended the deceased to be taken to the Royal Infirmary. There, two operations were performed, and the obstacle was eventually removed, through an opening which had been made in the front of the neck. Inflammation, however, set in, and the unfortunate girl died from exhaustion. The jury found a verdict of "Accidental death."

APPOINTMENTS.

Alexander, Adolphus, B., L.D.S., has been appointed Dental Surgeon to the Whitechapel Branch of the Metropolitan Provident Medical Association.

Mr. Harold Murray has been appointed to the newly-founded lectureship on "Operative Dental Surgery," at Guy's Dental School.

Mr. M. Alexander, L.D.S.I., has been elected Hon. Dental Surgeon to the Stanley Hospital, Liverpool.

LEGAL INTELLIGENCE.

On Saturday, March 8th, Edward Wilhelm Herman Arneemann, (an unregistered) Dentist was charged at the Notts Assizes before Baron Pollock, with attempting to murder Judge Bristowe, and with unlawfully wounding the Judge with intent to do him bodily harm.—As is well known, he believed the judge had acted unjustly, in giving a verdict against him, he being plaintiff in an action to recover the price of some artificial teeth supplied to the defendant. He was found guilty and sentenced to twenty years penal servitude.

Review.

The Medical Annual and Practitioners' Index.

[1890. Wright, Bristol.]

THIS, the eighth yearly issue, deserves commendation. It is a useful handy book, and upon the whole, the information is accurate and the arrangement good. We find with regret that the book has not had a dental editor appointed. In one of the preceding issues a very good dental article appeared, but for some reason—a mistake we think—the article was cut out in the succeeding issue and never reinstated. While the general level of the articles is good there are exceptions, and a lack of experience shows itself here and there arising probably from the somewhat junior standing of some of the editors. In common with other manuals this one suffers from the advertising department. Surely it would be better to place all advertisements at the end of the volume and not mixed up with the literary portion of the book. With the minor objections urged, we have said all that can be justly advanced against the annual; much may be said in its favour, and perhaps the best way we can show our appreciation of it is to recommend our readers to purchase it and judge for themselves, for it is a book everyone in the medical world should possess.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

ANOTHER VULCANIZER BURST!

To the Editor of the British Journal of Dental Science.

SIR,—It was not my intention to write, knowing that Dentists are, as a rule, sceptical with regard to Vulcanizer explosions, but an account of one in *Ash's Quarterly Circular*, exactly tallies with an explosion I had about three months ago. A moment after I had left the workroom a fearful report was heard, and everything there was “*debris*.” It had raised itself to the ceiling, then dropped down, the bottom being blown out.

My object in writing, however, is simply to point out to fellow-dentists the necessity of insuring instruments as well as furniture. I fortunately got compensation from the “Sun Insurance Office,” simply by stating that I was not a lawyer but a dentist, or should not have accepted the policy as drawn by their agent.

I am, &c.,

G. H. LAWRENCE.

WHAT ARE THE DUTIES OF AN HON. DENTAL SURGEON?

SIR,—Will you kindly inform me, what are the duties of Hon. Dental Surgeon to a Parish Hospital? Are you expected to visit the institution at stated times, and do any more than extract teeth, or do they send the patients to your house?

Yours, &c.,

INQUIRER.

[If there is an out-patient department, it is usual to have one or two fixed hours for attendance. The House-Surgeon usually then tells the Dental Surgeon, if he wishes him to see any in-patients. It is not usual to see patients at home unless the Dental Surgeon desires it to suit his own convenience. Extractions are the rule, fillings the exception, but “Inquirer” can reverse this with benefit to the patients. Will not our readers tell us what *they* consider the duties of an Hon. Dental Surgeon?—EDITOR.]

Dr. Parmly Brown, of Flushing, New York State, has removed to 716, Fifth Avenue, New York City, U.S.A. [*Ad.*]

Hospital Reports.

MONTHLY STATEMENT of operations performed at the National Dental Hospital, from Feb. 1st to March 1st:—

Extractions	Children under 14	.	.	.	.	.	.	320
	Adults	.	.	.	.	.	.	424
	Under Nitrous Oxide.	.	.	.	.	.	.	681
Number of patients attended								1832
Gold Fillings								97
Other Fillings								359
Irregularities of the Teeth								68
Miscellaneous								344
Total								2293

WILLIAM J. FISH, } *House*
ARNOLD PRAGER, } *Surgeons.*

Work done at the Birmingham Dental Hospital during the month of February, 1890:—

Extractions	.	.	.	.	.	.	.	364
Plastic Fillings	.	.	.	.	.	.	.	68
Gold Fillings	.	.	.	.	.	.	.	28
Miscellaneous and Advice	.	.	.	.	.	.	.	106
Anæsthetics	.	.	.	.	.	.	.	21
Males	.	.	.	.	.	.	.	119
Females	.	.	.	.	.	.	.	152
Children	.	.	.	.	.	.	.	108
Total	.	.	.	.	.	.	.	587

FRED. R. HOWARD, *House Surgeons.*

Work done at the Victoria Dental Hospital of Manchester, during the month of February, 1890.

Number of patients attended	.	.	.	.	.	.	.	1055
Number of Extractions	.	.	.	.	.	.	.	732
Number of Extractions under Anæsthetics	.	.	.	.	.	.	.	118
Gold Stoppings	.	.	.	.	.	.	.	31
Other Stoppings	.	.	.	.	.	.	.	174
Miscellaneous	.	.	.	.	.	.	.	287
Total	.	.	.	.	.	.	.	1342

CHARLES H. SMALE, *House Surgeon.*

ERRATUM.

Page 288—line 9 from bottom, for *Miller* read *Mills*.

British Journal of Dental Science.

No. 534. LONDON, APRIL 15, 1890. VOL. XXXIII.

COPPER AMALGAM: ITS ADVANTAGES AND PREPARATION.*

By Mr. E. P. COLLETT., L.D.S.E.

Mr. President and Gentlemen,—My apology for bringing the subject of Copper Amalgams before you this evening, is, that during the last three or four years, I have been more and more convinced of its utility, and have been glad to notice its gradual growth in popular favour and estimation.

Amalgams made from precipitated copper have been known and used for upwards of forty years; and while condemned on several sides, have had strong advocates in favour of its partial, though not universal use for suitable cases.

The principal arguments against its use are—

1. The unsightly appearance caused by discolouration, either of the amalgam or the tooth itself.

2. Its softness compared with other amalgams, rendering a mastication-surface composed of it less durable than one composed of other amalgams.

With reference to the first objection to its use, there is no doubt, that owing to the reckless use of this valuable agent in the front part of the mouth, and also partly to its faulty preparation, it had fallen greatly out of general use, many dentists having entirely given up its use. But while its colour is certainly against it, all who have tried it will admit that in soft chalky teeth, especially where associated with a viscid state of the saliva no filling material stands so well in the mouth. When we remember that any irritation of mucous glands is both a cause and a consequence of indigestion, partly by interfering with the physiological activity of the saliva in the primary metabolism of starchy food, and partly by mechanically entangling particles of food, and causing their retention and ultimate decomposition in the mouth itself, it becomes very evident that, at the gum edge of teeth, especially of lower molars, any amalgam of good antiseptic power must have advantages over less antiseptic

* A Paper read at the Manchester Odontological Society.

amalgams as a preventor of further decay ; and indeed in this situation, viz., at the gum edge, as well as in inaccessible cavities, that is, cavities which, by reason of their position, are difficult to clear of all defective dentine, practice has shown that this material, because of its undoubted antiseptic properties, is frequently the most valuable that we can use to prevent further decay.

With reference to the second objection, viz. :—its softness in comparison with other amalgams on masticating surfaces, there is undoubtedly something to be said, but still the difficulty can be obviated by finishing on masticating surfaces, either with gold or an amalgam of a higher grade, such as Davis', Hallam's or the Standard Amalgam. Either method can be pursued at the time the filling is first inserted, or at a subsequent sitting when the basal portion has become hard.

I may say, that I frequently line deep cavities with copper and finish with gold *at the same sitting*, obtaining thereby a slightly filling, and securing at the same time all the advantages of the antiseptic copper. In large cavities in lower molars it is an easy thing to place some dry fillings of one of the tin compounds on the top of the copper amalgam, and by the use of the burnisher, get a nice light coloured surface which *does not often* discolour. In fixing crowns, we have *another* use for our Sullivan.

Personally, I always use platinum tubes in pivoting front teeth, and invariably employ this agent around the tubes, never yet having had one come out where the tube had been properly roughened to allow of the amalgam holding.

The *Posts* of Bonwill crowns, fixed with this amalgam rarely give way. I have seen some beautiful porcelain crowns, specially made for Mr. Balkwill, of Plymouth, fixed by this agent, which showed signs of remaining firm indefinitely.

The liability to discolour teeth will always be a fatal objection to employing copper amalgam in the front of the mouth. In a few cases the enamel of the labial surface of a cavity in a canine may be lined with one of the white fillings, previous to finishing with this amalgam.

The power to discolour teeth may be reduced to a minimum by careful preparation of the stopping.

The older way of preparing it was by precipitating copper from a solution of sulphate, with mercury at the bottom of the vessel that contains it, by stirring the fluid with a bar of zinc.

A better way, and one that we now employ, is to substitute

a clean *iron* bar for the *zinc* one, and leave it from 12 to 24 hours in a jar containing the solution. The iron bar becomes covered with a dull reddish flocculent precipitate having very little resemblance to copper. When a sufficient quantity of the precipitate is formed, it is then collected into another jar, and well washed by a stream of cold water running over it, until it becomes quite clean, as shewn by the colour of the water. When sufficient precipitate is formed it is ground up in a mortar with mercury until it begins to amalgamate. The amalgamation is hastened by hot water being used, to which a little sulphuric acid has been added, as the process of amalgamation takes place the water can be poured off. The Sulphuric Acid clears off traces of iron that may be in the precipitate, and the acid is afterwards neutralized by dropping a few minims of *Liquor Ammoniac* to the water before finally pouring it off. Plenty of "elbow grease" is required to get a really well amalgamated mass, and it is somewhat hard work.

If too much mercury is used at first, and if the mass is not ground up sufficiently, one gets a softish amalgam. Practice in making it is required, and even when every care is taken occasionally an unsatisfactory product results. The amalgam should be rolled into small pellets and allowed to set and never used for the first twenty-four hours.

When they have set, one can easily ascertain with a sharp penknife whether the sample is hard or soft. If it cuts too readily with the knife all the pellets should be heated up until the mercury is quite driven to the surface, well ground up again, and rolled afresh into pellets after the excess of mercury has been squeezed out through wash leather. On examining the pellets after they have once more set, they will be found to be much harder.

Dr. Elliott found that bricks made of amalgam, which had been heated up five or six times, took more force to break than similar bricks made from amalgam, that had been only heated up once.

From my own experience I quite think, that it is better to overheat rather than under heat the pellets, if necessary adding additional mercury to render the mass sufficiently plastic.

I always save the scraps that are generally left over each day, and use them up again, thus getting quite as good if not a better and stronger filling than from freshly made material, such a filling certainly seems to wear on a masticating sur-

face better, which bears out Dr. Elliott's statement. Occasionally with newly prepared amalgam, where, in making, the mercury has been added too rapidly, and where the mass has not been ground up sufficiently, one gets a quick-setting amalgam which is far too soft to be of permanent value. By carefully heating this again and thoroughly tritulating, a good serviceable amalgam can be made of it.

Mr. Boyd Wallis, in an article in the *Dental Record*, for February, 1889, advocated boiling the precipitate with dilute sulphuric acid, then thoroughly washing and pressing between blotting paper and finally drying in hot air.

I have not found any advantage in employing this method with precipitate that has been deposited on iron, indeed it seems an easier way to prepare the amalgam by the method just described. Where *zinc* bars are used instead of iron, it certainly seems advisable to use plenty of sulphuric acid to clear off the zinc which is evidently present in more than traces.

With regard to precipitation by *Electrolysis*, I have had no personal experience.

In preparing the solution of copper sulphate, care should be taken that it is not too strong, as in that case the copper is precipitated in small hard metallic particles, which do not so readily amalgamate as the finer, flocculent precipitate. With a little experience one can tell the right strength by the colour of the solution.

With bars of zinc you get a dirty blackish precipitate, which amalgamates more readily than that thrown down by iron, forms a much softer filling, which keeps a better colour itself, but which undoubtedly stains the tooth considerably more.

In fact, it may be generally admitted, that where the filling goes black hardly any staining of the tooth itself takes place except in cases where the tooth is unusually soft. Of course the colour of the amalgam would show through frail enamel. Under copper amalgams, pulps do not so readily die as under amalgams which do not contain copper.

A tooth that has recently had an amalgam filling inserted is often exceedingly sensitive to extremes of temperature at first, but under copper this sensitiveness passes away much quicker than in cases where amalgams of a higher grade are used. The copper seems to have a hardening effect on the sensitive dentine, whether by penetrating the dentinal tubes or not, we cannot say. Caries hardly ever starts afresh under

this amalgam, certainly not to the extent that it does under many.

From certain experiments, Dr. St. George Elliott, in a paper read before the Odontological Society of London, clearly demonstrated that copper amalgams shrink in setting more than those containing tin and silver only. But in practice one finds that this is of little moment.

The edges of old fillings in crown cavities, that have been doing service for some time, often appear to stand up above the surrounding enamel. This apparent change is due to want of care in finishing the filling at the time it is inserted, and to leaving a thin layer of amalgam beyond the edges of the cavity. These flakes of metal afterwards break off during mastication, and hence the filling appears to have risen.

The best way to obviate this, is, whenever possible, to carefully polish the filling at a subsequent sitting, taking especial care that the edges are flush with the enamel. To get the best results from copper amalgams, as well as with all other amalgams, fillings should at a second sitting be as carefully polished and finished off with as much care as one would finish a gold plug. I am quite aware that it is not always possible to persuade a patient of the necessity of coming back for this, even where you take pains to assure him that no extra fee is expected.

It is the careless manipulation of amalgams that often discredits their use, and drives patients to those dentists, who have the reputation of filling teeth with gold alone.

If the pellets of amalgam, such as we buy at the various depots are over-heated, on breaking up and tritulating in a mortar, a reddish hue is often seen in the mercury. I cannot say whether this is due to the presence of iron or to the fact, that in heating up, the copper has been, as it were, "roasted."

If the amalgam is put into the tooth in this state, discolouration generally ensues. In one such case where a dead tooth was filled and all the excess of mercury left in, the tooth was almost black the next day, while the filling which was somewhat soft, retained its colour. This tooth has been under observation for nearly four years, and the filling is slowly wearing away, though no fresh decay has arisen in the tooth.

As a root filling this amalgam can also be used, but it is better to limit its use to the roots of those teeth that have recently had their nerves extracted by the dentist himself, and

not to employ it in cases where any suppuration has taken place previously.

The reason for this precaution is obvious. One of the secondary advantages of using this amalgam is its comparative low cost.

Dr. Elliott calculated that an ounce of this amalgam could be produced for 7d., if made at home, while the cost of Stewart's amalgam is 4s. 6d. per ounce. I mention "Stewart's" as it seems to be one of the best in the market, and is prepared with iron and not zinc as the older forms known as "Sullivan's" were.

To sum up, the disadvantages of copper amalgam are—

(a) Its softness, and consequently its inability to stand as well on masticating surfaces as many other fillings.

(b) Its tendency to discolour the tooth it is employed in.

While the advantages of using it which to my mind far outweigh the disadvantages, are—

(a) Its antiseptic qualities.

(b) Its undoubted ability to harden the dentine.

(c) That pulps do not die so readily under it as under amalgams that contain no copper in them.

(d) Its low comparative cost.

OBSERVATIONS ON THE STRUCTURE AND DEVELOPMENT OF OVARIAN TEETH.*

By T. CHARTERS WHITE and J. BLAND SUTTON.

THE structure and development of teeth found in ovarian dermoids have not been investigated in a manner commensurate with the interest of the subject. In this communication it is our intention to record a few facts relating to these remarkable teeth. In shape, size and number they seem little influenced by the age of the patient or the proportions of the cyst. Dermoids in the ovaries of children may contain teeth, whilst similar tumours in adult and old women contain none. The age at which teeth develop and erupt in dermoids is independent of the individual's age. In children, five, seven and ten years of age, dermoids have been found with many teeth fully erupted. Recently one of us examined such a

* A Paper read before the Odontological Society.

tumour, the size of a cricket ball, removed from a girl of seven years ; it contained a lock of hair thirty inches long and six erupted teeth, and several others with their crowns still covered by stout membrane. In adults, dermoids are occasionally seen with teeth in the earliest process of development. We are equally unable to make any statement as to the age at which ovarian teeth are shed. One of us has established the fact that as age advances the hair in dermoids turns grey and is subsequently shed, the cyst becoming literally bald ; but an edentulous dermoid, in the sense that the teeth have been shed, has yet to be demonstrated.

The number of teeth in a dermoid varies greatly—in many probably half, perhaps more, none are detected. When present they are frequently overlooked by the operator and his assistants, hence no reliable statistics are forthcoming. Sometimes two or three teeth are found, in others twenty, and in large multilocular dermoids as many as four hundred have been counted. Such abundance is rare. When the number exceeds twenty, teeth may be described as numerous. As a rule they are embedded in loose bone resembling the alveolar borders of the jaws. Often they project from a flat piece of bone like the heads of nails driven into a piece of wood. In most specimens it seems to us that the bone in which the teeth are socketed is developed subsequently to or concurrently with their development, because in many instances such teeth are lodged in the soft tissues of the tumour, especially when unerupted, and the germs are found unassociated with bone or cartilage. The fang is completed after the eruption of the crown, as is the case with natural teeth. The sockets of these teeth are lined with periosteum, or as it is more appropriately called, alveolo-dental periosteum.

In dermoids teeth are not scattered through the tumour, but are usually collected in a group, or less frequently in two or more clusters. This congregation of complex structures is very marked. In the specimen the skin, hair, glands and teeth are confined to a small space: beneath the skin four unerupted crowns were found. Mr. Tomes' *Manual of Dental Surgery* (3rd ed.), contains an excellent example of this "swarming" of teeth upon a small piece of bone from an ovarian dermoid.

In shape ovarian teeth vary greatly. Frequently they resemble supernumerary teeth ; some resemble incisors or canines. Often the crowns are bicuspidate or multicuspidate, and nearly always the fang is single. An ovarian tooth with

two fangs is in our experience very rare. From the comparison of a larger number of these teeth it seems that the crown develops at the expense of the root. Teeth with small crowns possess long roots. Gemination occasionally occurs.

The structure of ovarian teeth has been investigated by Owen and Salter. Coleman investigated them from a thoracic dermoid. Salter showed that in some of the long and slender teeth no central chamber was demonstrable; the dentine fibrils in these radiate, as it were, from a central point or line. This we are able to confirm; Coleman also noticed this. We find that in ovarian teeth enamel and dentine are always present; cementum is not so constant. The enamel is lodged upon the crown in lumps, or hummocks, with deep ravines often extending to the dentine. This is well illustrated in Owen's figure. The enamel fibres run in all directions, they are in fact very disorderly arranged; in one specimen enamel gradually merged into, and became directly continuous with, bone.

Dentine maintains its normal relation to the enamel and pulp, but near the end of the fang becomes very irregularly disposed and twisted like geological strata after a severe earthquake. The peculiarity known as looped dentine is occasionally seen. Between the dentine and enamel large and conspicuous interglobular spaces exist.

The amount of cementum is variable; in many teeth it is absent. In others it exists only in a very thin layer: in some it may be detected coating only one side of the fang. Although we find the three elements—enamel, dentine and cementum—occupying normal relations to each other, yet the two first elements seem so convulsed in their development that in apparent order all is disorder.

The pulp is very irregular. As has already been noted, many of the bicuspidates, incisors and canines lack a pulp chamber, whilst in multicuspidates it is of fair size. In many the pulp is converted into osteo-dentine; in others it contains vascular fibrous tissue, the teeth presenting an apical foramen. Often the pulp is full of fat globules.

The existence of nerves in the pulp of ovarian teeth has been demonstrated by Salter in the paper already mentioned, but no one has confirmed this important observation. We have devoted particular attention to the anatomy of the pulp, and are able to state that in some specimens the pulp presents the same characters as in an ordinary tooth; it exhibits connective tissue traversed by blood vessels in great number;

sometimes nerves are present, and in one fortunate section a few large cells are seen lying close to the dentine, occupying the situation, and displaying the usual character of odontoblasts.

This part of the investigation will receive further attention as suitable material comes to hand. There is nothing remarkable in the existence of nerves in the pulp, for nervous matter has been demonstrated in ovarian dermoids by Henry Gray, 1853, and recently by Neuman, 1889.

A few days ago one of us was fortunate enough to detect nervous matter in an ovarian dermoid. The opposite ovary contained teeth, and these were carefully decalcified and the pulp of one found to contain structures resembling large nerve fibrils. Further, dermoids, in other regions (orbit and back) must contain nerves, for patients can localise the prick of a pin quickly and readily when, from accident or design, the inner walls are exposed. It is also well to bear in mind that ovarian dermoids are often the seat of peculiar pain, and on more than one occasion it has been possible to suggest the nature of the tumour from the character of the pain. We are unaware of any previous attempts to trace the development of ovarian teeth. Recently a specimen came to hand in which we have been enabled to trace their development, and demonstrate their origin from structures similar to those arising under normal conditions. This part of the investigation is of interest, as it throws unexpected light on one form of supernumerary teeth.

In dermoids, loose rounded bodies not unlike sugar-coated pill, or the boiled lens of a fish's eye, are occasionally found. These bodies are composed of cells, and are named epithelial pearls. Such a pearl is shown in section and *in situ*, the cells are large, but become compressed as they approach the peripheral part of the pearl, and finally become lost in the enviroing capsule. In the same section we can study their mode of origin as ingrowths from the surface epithelium, which gradually becomes isolated in the surrounding tissues. After their enclosure such pearls may increase in size from growth of the enclosed cells; the lens in our eye grows in a similar manner.

The epithelial pearls are worthy close study, for they are allied to enamel organs—indeed, they may be regarded as enamel organs, for one of these is shewn descending like an avalanche upon a dental papilla beneath. We see one enveloping the head of a papilla like a normal enamel-germ, and re-

maining connected by means of a neck with the free surface of the loculus from whence it arose. Many of these germs lack a definite follicular wall ; this may possibly explain the deficiency any occasional absence of cementum to the fang. As yet we have not succeeded in detecting any evidence of germs of secondary teeth ; this may be owing to the limited opportunities of examining the developmental stages of ovarian teeth.

It is remarkable that these pearls may remain cellular or give rise to enamel. In some dermoids they undergo transformation into horn or nail.

The relationship of epithelial pearls and enamel organs is of interest in another direction. The pearls have been most closely studied in the median line of the hard and soft palate, that is, in the line of two epithelial covered structures. As a rule they are small in size, but occasionally act as tumour germs and give rise to neoplasms known as palatine adenomata. It has recently been pointed out that such pearls are occasionally associated with papillæ in the meso-palatine suture and give rise to a not uncommon phenomenon, viz., a meso-palatine tooth. As epithelial pearls are found in the neighbourhood of the gums, they may account for some forms of supernumerary teeth beside the meso-palatine variety. Some of these pearls have been described as remnants of the gubernaculum. This is possible, and may account for their irregular shape and diminutive size.

A study of ovarian teeth is instructive in another way. It has on more than one occasion been stated that they are liable to caries, but no reliable evidence, and what would be infinitely more valuable, no specimens, are forthcoming. Occasionally an ovarian tooth is seen with a small cavity in its crown communicating in some cases with the pulp, but these cavities have only been seen in macerated teeth. Such cavities are capable of explanation without invoking aid from caries. We have pointed out that the enamel on the crowns is hummocky, and the cleft between the hummocks extends to the dentine. These clefts are usually filled with fibrous tissue, hence, when the specimens are macerated, the soft tissue decays away, leaving a channel or opening. We are of opinion that a carious tooth has yet to be demonstrated.

In conclusion, we may point out that much remains to be investigated in connection with ovarian teeth, and especially in regard to their characters when occurring in the ovaries of other mammals. It has long been known that such

tumours in sheep contain wool ; in horses, hair ; and in pigs, bristles. In birds they are said to contain feathers. It would be interesting to ascertain if in tooth-bearing dermoids in these mammals the type of teeth is a mimicry of those characteristic of the particular mammal in which the dermoid occurs.

(To be continued.)

ANÆSTHETICS IN RELATION TO DENTAL SURGERY.*

BY MR. OSBORN.

ANÆSTHETICS have a special interest to the members of our profession, inasmuch as every means capable of allaying the excruciating pain and shock to the nervous system, caused by extracting teeth, is a boon to the patient, demanding every attention from the Dental Surgeon. I wish to-night to deal, to the best of my ability with the three most commonly used agents to produce anæsthesia, viz. :—nitrous oxide, gas, chloroform and ether.

The former of the three agents is, I may say, almost exclusively used by the Dental Surgeon, and, therefore, I will deal with that first. It will not be out of place to give you a brief outline of the early history of anæsthetics. To our American cousins we owe the discovery of their use, and we may be pardoned if we are a little conceited over the fact, that, but for the genius of two American dentists, Drs. Wells and Morton, we might still be in the dark upon this subject. Priestly discovered nitrous oxide at end of 18th century, and Sir H. Davey observed its anæsthetic properties about 1800.

In 1844, Dr. Horace Wells observed the anæsthetic property of nitrous oxide, and I think, administered it in his own surgery, but nothing much came of it. Later Dr. Morton discovered sulphuric ether, but this agent did not suit very well, and chloric ether was employed instead, and from this a Mr. Waldie, if I am not mistaken, a Liverpool man, separated chloroform which was, as you know, first administered by Sir James Simpson in 1847.

Nitrous oxide went to the wall, and chloroform waged war with ether for the superiority in popular favour. Ether was pronounced less dangerous, because it did not depress the heart's action, but even stimulated it.

* A paper read at the Liverpool Dental Hospital Student's Society.

Professor Lister was the great champion of chloroform in its early days, and continued to uphold its merits, and to my idea, he always had the best of the argument.

But what had become of nitrous oxide? The pioneer of its two powerful rivals, it remained disused and forgotten until Dr. S. W. Evans, of Paris, exhibited its anæsthetic properties at the London Dental Hospital in 1868.

A joint committee of the Odontological Society and the London Dental Hospital, in 1872 published a most favourable report.

Ever since, nitrous oxide has grown in favour in the dental profession.

About the other two anæsthetics, discussions have been continuous, and to day if you trouble to pick up a "*Lancet*" you will find letters in favour of both chloroform and ether.

I have endeavoured to give you a short summary of the history connected with anæsthetics, and will now proceed to the more practical part of my paper.

Nitrous oxide is by far the safest anæsthetic we have, its after effects upon the patient are very small indeed, a great thing in slight operations requiring the extraction of a few teeth. I have seen it mentioned, that from 6 to 20 teeth may be extracted under one administration. I should like to see the gentleman who extracted 20 teeth? One good tough stump will often take the smartest operator all his time.

Anæsthesia is the paralysis of the nerve centres in a certain order: 1st, The cerebrum 2nd, The sensory centres of the cord. 3rd, The motor centres of the cord, and lastly, if pressed far enough, the sensory and motor centres of the Medulla. After which the functions of life are at an end.

The moment or time when operations should be performed is, of course, when nothing remains at work in the human system, but the respiratory and cardiac centres.

Every administrator of Nitrous oxide should be familiar with the phenomena of normal anæsthesia. After a few inspirations the face becomes pale and also slightly bluish, the fingers and other parts of the body are convulsed by spasmodic twitchings, then the conjunctivæ become insensible to touch, and the final signal of complete anæsthesia is the stertor caused by the vibration of the arytaeno-epiglottidean folds. In administering Nitrous oxide, never be led away to trust to the pulse. Some administrators place great stress upon careful notice of the radial or carotid arteries. What a delusion? All the pulse would tell would be the "death" of the patient,

for have not innumerable experiments proved, that respiration ceases before the heart's action, even to the amount of many seconds. Should one operate before complete anæsthesia? physiologists say no; because the heart is accelerated by the vasomotor and inhibited by the vagus nerves. Therefore the stimulus of a shock to the 5th, which we know affects the vasomotor centres, will produce no effect if the nervous system is in working order, but as the vasomotor is paralysed before the vagus centre, under an anæsthetic, extreme depression would result, if a shock to the 5th was produced during this stage, both centres should be abolished, then it is safe to operate.

I do not think there is the slightest need to make an examination of the chest, or ask with a seriously cautious air, if the patient has had any kidney complaint, epileptic fit, has an aneurism, suffers from hysteria or chorea; if a female, as to pregnancy, menstruation or lactation, these are no drawback to the administration of nitrous oxide, but the questions tend to frighten and make the patient nervous, especially the timid.

Another important matter is never to allow air to mix with the gas, see that the face-piece fits properly, and if the patient has a beard use some soap or pomade to rub it with. I myself have seen cases where extreme trouble has been caused by the beard.

In phthisical patients, it is to be borne in mind that anæsthesia deepens after the face piece has been removed, so, less gas should be given. Apoplectic people require a little care also, all should be free around throat and chest. This reminds me of the death which occurred last year in Edinburgh, caused, there is no doubt, by the stupid and irrational fashion of 'tight lacing,' all the more to be rebuked in this case, because the patient being an elderly one would expect a little common sense. The operator had previously asked the patient if her corsets were tight and was informed they were not, yet after death they had actually to be cut off the person.

I think the best way to prove if a patient's corsets are extra tight or not, is to ask the patient to take a few long deep inhalations, and closely notice the chest walls, then, if the expansion is to your idea not enough, demand that they should be loosened.

Syncope proper never occurs under nitrous oxide, but less severe forms of heart failure may be sometimes met with, for instance, if a patient is weak, and has just recovered from

illness, faintness may occur, also the breathing may become very shallow, this is often met with causing inexperienced administrators alarm ; a few whiffs of nitrate of amyl will bring the patient to a normal patient.

Many people think that death under nitrous oxide, results from asphyxia of late years ; that opinion has changed, you have only to read Paul Bert's most interesting papers upon his researches made from 1871-79 to hear conclusive arguments to the contrary. Dr. Buxton, of London, also shows clearly that the old views are wrong. Experiment shows that nitrous oxide produces anæsthesia before it kills, and animals simply rendered apnœic are not anæsthetic until moribund. Nitrous oxide also kills in less than two minutes and apnoea takes over five. The blood pressure under nitrous oxide remains unchanged until the blood becomes fairly saturated then it falls, but steadily recovers if access of air be allowed. This is quite in contrast with the wild and erratic excursions which occur in the post-asphyxial state. Respiration is slightly accelerated at first, but when consciousness fails, respiration grows slower and slower, and if death be superinduced by the gas, the respiration gets shallower still and finally ceases. These symptoms are quite in contrast with death brought about by asphyxia ; most of you know the wild conscious convulsions that accompany the latter death. These remarks clearly show it possesses a specific action and does not narcotose by reason of its asphyxiating qualities.

(To be Concluded.)

THE PHYSIOLOGY AND TREATMENT OF SENSITIVE DENTINE.*

By G. M. KEEVIL.

Mr. President and Gentlemen,—In order to treat of this subject, it is necessary to briefly refer to the structure of dentine, well-known though it may be to most of you. This tissue is usually defined as a hard calcified matrix, permeated by a system of channels, which contain a process or elongation of the odontoblast layer of cells, this layer being in connection with the layer immediately beneath them, thus

* A paper read at the Student's Society, National Dental Hospital.

establishing an intimate relation between the pulp and dentine. This fact, first proved by Sir John Tomes, is alone sufficient to warrant the theory that the sensibility of dentine is dependent upon the pulp. But the fact, that Boëdecker has demonstrated the presence of a minute plexus throughout the whole structure of dentine, derived from the ultimate branchings of the fibrils, is an additional support to such a theory. Dentine thus presenting an appearance of a nervous supply analagous to that of the other tissues of the body.

Salter believes that dentine has a nervous connection both with the pulp and periosteum, and in support of this he mentions instances of dentine retaining an intense insensibility after direct connection with the pulp had been cut off. As he observes, however, it does not necessarily follow, that the connection between the pulp and dentine should be by a direct radiation from the pulp in the course of the dentinal tubes, it may be circuitous, and thus an outlying mass of dentine retains its sentient connection with the pulp, and if we remember Boëdeker's demonstration just mentioned, this latter view would appear very probable, and more so because we can only admit that any connection between the pulp and periosteum could alone occur in that portion of the tooth, which is enveloped in that membrane. It is interesting historically to note, that John Hunter did not consider dentine to be a tissue capable of transmitting sensation. He says, that teeth are occasionally worked upon by operators in the living body without any pain being felt; but he evidently had not had much experience in the matter.

It has never yet been determined how the nerves of the pulp terminate. Tomes states rather vaguely that they terminate in a rich plexus beneath the odontoblast layer. Boll, however, in investigating this point, found that on treating a pulp with dilute chromic acid solution, an immense number of medullated nerve fibres could be traced onward into non-medullated ones, the ultimate destination of which, however, was uncertain, but he has seen them, passing between the odontoblasts and taking a direction parallel to that of the dentinal fibrils, in such numbers that he infers they have been pulled out of the dentinal tubules, still he has not definitely seen a nerve fibre to pass into a canal. His observation has been controverted by Magitot, who recently stated, that he had fully satisfied himself that the nerves of the pulp become continuous with the stellate layer of cells, and through the medium of these with the odontoblasts. If this

latter view be correct, the sensitiveness of dentine would be accounted for without needing nerves to absolutely enter it, for the dentinal fibrils would then be prolongations, so to speak, of the nerves, and, as Tomes says, it is not necessary to assume that the dentinal fibres should actually be nerve fibres, for many animals of a low organisation are capable of sensation, although they have no demonstrable nervous system.

The foregoing facts plainly point to the conclusion, that a certain degree of sensibility in dentine is normal on histological grounds, there is also the following fact, that dentine loses all sensibility on destruction of the pulp, whether this degree of sensibility varies at different ages or not is uncertain. I have been unable to find statistics bearing on this point, or upon another interesting one, namely, what relation if any, the sensitiveness of dentine bears to the state of the rest of the nervous system at the time of observation. With regard to the latter question, Dr. White in an article in the *Dental Review*, mentions two or three cases, in which a highly nervo-sanguinous temperament was accompanied by an exquisitely sensitive state of the dentine, and one of these, the children, inheriting the mother's temperament, presented also a like dental condition. More statistics are required to decide whether this was merely a coincidence or not. It is also said that the teeth of young persons, especially those just arriving at the age of puberty, are exceedingly sensitive, and to be more particularly marked in girls. It was formerly supposed, that, in aged or senile dentine, the fibrils atrophied or became calcified and that in consequence sensation would be gradually lost, but Wedl proved that they were still there, and also retained their property of imbibition. It is only fair, therefore, on Histological grounds to suppose that they still keep their sensibility. Regarding the uses of sensation in dentine nothing is known, some think that the fibrils, left there in the ordinary course of development, their sensibility is merely a matter of sequence, but one cannot help thinking, that things do not happen in this haphazard way in the human body. Mr. Coleman is inclined to accord them a special function, probably tactile, by which we are enabled to judge of the nature of the substances, which come under their action, and also to judge of the requisite amount of mastication, for it is an undoubted fact, that persons with artificial teeth, find at first considerable difficulty in ascertaining when their food has been sufficiently masticated. It appears to me,

however, that this function, which is entirely dependent upon pressure, is more probably performed by the periosteum. It is suggested that the most likely use of the sensation is to give warning of the encroachments of caries, and to be connected with the throwing out of secondary dentine.

Being pretty well agreed, therefore, that a certain degree of sensibility in dentine is normal, we must regard any exalted state of such sensibility as a pathological condition, but to what this hyperæsthesia is due is a matter which has been very violently discussed, without any definite conclusions being arrived at. The most usual thing, in order to get out of the difficulty, is to put it down to inflammation. The only thing which can be said against this is, that the dentinal tubes are too small to admit blood corpuscles, even this is a false objection, as there are countless numbers of immature corpuscles, the so-called "microcytes," which are capable of being exuded into the tubes. Thomas Bell, in endeavouring to establish the inflammatory theory, says, that in many cases, after breaking open a tooth, immediately after extraction, where the pain and inflammation had been severe, he found distinct red patches in the very substance of the dentine. He also states, that on examination of the teeth of persons killed by drowning or hanging, he found the whole of the osseous part of the tooth, with the exception of the enamel, tinged a deep red. He places this against the objection of Hunter and others, that the teeth have never been satisfactorily injected, and he especially mentions the case of a patient, who died from jaundice, in which the dentine was found to be of a bright yellow colour. Amongst modern authorities who are in favour of the inflammatory theory may be mentioned Drs. Harris and Taft, but the great objection is, that no treatment scientifically based on this theory produces any satisfactory results. Another and more plausible suggestion is, that the pulp itself is really the seat of the exalted sensibility, and the fibrils are merely the agents through which external impressions are conveyed to this central organ. Rational treatment based on this hypothesis would be the administration of such drugs, as, acting on the nervous or circulatory systems, or both, should lower this exalted condition. Experiments involving the use of nervous and arterial sedatives have not tended to confirm this theory, although morphia is said to be of use in such cases as those before mentioned, in which great sensitiveness of dentine was a peculiarity of a nervous temperament. In these cases, how-

ever, the hyperæsthesia cannot be considered to be a pathological state.

Another suggestion to account for this peculiar condition is, that it is caused by the crowding of bacteria into the dentinal tubes, when disturbed by an exciting cause, and so causing pressure on the fibrils.

Dr. Willmott's opinion is that hypersensitive dentine as a pathological condition is analagous to that condition known as "teeth on edge," and is produced by the same general causes, the irritation of an acid. He says that in these cases of "teeth on edge" from eating sour fruit, etc., the acid concentrated and abundant, passing through pores and cracks in the enamel, acts on the peripheral extremities of the fibrils, and causes such irritability in the dentine, that the slightest impact or change of temperature gives pain. He goes on to say that in the hyperæsthesia generally observed in practice, associated with caries, the irritating acid is very dilute, so that the effect is produced slowly, requiring for its manifestation greater changes of temperature, or some clinical or mechanical injury, as the cut of an excavator. The difference of the two conditions being in degree only. In the former, the irritant being in action for a short time only, and soon becoming diluted with saliva, the exalted sensibility rapidly subsides. In the latter, the irritation due to an acid condition of saliva, is persistent, and the hyperæsthesia soon becomes chronic.

I have now to pass to a more practical point, namely, "treatment."

The internal use of morphia has already been alluded to, the conclusion being that it is only of use in cases of systemic nervousness, and being a dangerous drug to play with, should be excluded as much as possible from use by the dental practitioner, the risks not being counterbalanced by satisfactory results.

In cases in which the sensibility is referable to an acid condition of the secretions, a removal of the cause will at once suggest itself, cases such as these which occur so frequently in children are easily corrected by the use of alkaline remedies, such as bicarbonate of soda or potash.

In such cases as are not included in the above, a lot may be accomplished by gaining the confidence of the patient by tact of manner and touch, and by the proper use of sharp instruments. It is those cases, such as erosion cavities, in which the dentine is so hard as to require the determined use of the engine,

which give so much trouble both to the operator and patient. To find a remedy for this class of case the whole *Materia Medica* has been ransacked from one end to the other, with very indifferent success. Dehydration by means of absolute alcohol followed by warm air is one of the first things which should be tried, its apparent action being the subtraction of water from the organic material in the dentinal tubes, causing its contraction. The next most primitive method of treatment is the application of creasote or carbolic acid, the latter by preference. Carbolic acid is a drug, in which relative dryness of the cavity, and relative maintenance of the strength of the application, produce proportionably satisfactory results, but it requires to remain for two or three hours to do any good. Dr. Flagg considers this drug to act in a two-fold way, both by forming insoluble phenates with the organic constituents of the dentine, and by anæsthetizing, to a slight degree, the pulp, rendering that organ less susceptible to irritation.

The next on the list of this class of remedies is a very favourite one, chloride of lime. In using this it is absolutely essential that the cavity be as dry as possible, as success depends upon its being undiluted, and in order to secure this, it has been recommended to place small fragments of it in the cavity and allow them to deliquesce of their own accord. Fifteen minutes is usually sufficient time for this drug to produce its effects; unfortunately, however, its application is usually attended with intense pain, and I am not aware that any means have yet been found for avoiding this. Occasionally, in deep seated cavities, the application of chloride of zinc produces pain of a beating kind; it is an indication that the pulp is being affected, and this should be at once controlled by washing the cavity out with warm water and introducing a little oil of cloves.

Side by side with chloride of zinc may be placed nitrate of Silver, which is said to affect the dentine to a greater depth and to be less painful, but the unfortunate discolouration which it produces, is an effectual bar to its use, at any rate in front teeth.

The last of this series of drugs is arsenic, but although this substance is undoubtedly the best obtunder at present known, its use is almost unanimously condemned on account of its deleterious effect on the pulp. If however its use is resorted to as a last resource, Dr. Harris recommends $\frac{1}{10}$ gr. to be applied and allowed to remain for about an hour. It is

doubtful though, whether its employment is justifiable for the purpose of simply obtunding dentine.

With regard to electricity, as applied for the purpose of treating sensitive dentine, Dr. Harris mentions the galvanic cautery as being useful.

Dr. Flagg states, that in many cases he has found galvanic electricity of great use in obtunding, but it does not always bring about the result. He uses it, by placing one pole of a large bichromate battery on the gum over the root of the tooth, the other being placed in the cavity, each pole for better connection being tipped with sponge, it probably acts by producing a retraction of the organic material contained in the dentinal tubes, in the same way that electricity is known to cause the contraction of protoplasm, when applied to it as a stimulant.

In concluding my short paper, gentlemen, I trust that you will attribute its brevity to lack of material, not to want of painstaking in trying to get it together.

THE AGITATION by the Members for a greater participation in the College of Surgeons, goes forward. The Parliamentary Bills Committee of the British Medical Association, have approved a bill, which we give in a concise form :—

1. Members to be under no disqualification for office.
2. All members of ten years' standing to have votes for the Council elections.
3. An annual report to be presented by the Council in November. The Council to convene a special general meeting if required by one hundred Fellows and Members. Votes passed by a two thirds majority, at these meetings, to be binding on the Council, provided there be three hundred present. Fellows and Members to have the right of meeting in the College at reasonable hours.
4. Section 17 of College Bye-laws to be invalid.
5. The first elected Council to decide as to the number of members to have seats on Council, the minimum number to be six, and the maximum qualification, twenty years standing. The term of office to be shortened, and the manner of electing examiners amended.

British Journal of Dental Science.

LONDON, APRIL 15th, 1890.

SCIENTIFIC RESEARCH.

At the present time, an observant man must be struck by the fact, that Dental Surgery is in the very middle of one of those waves of progress which ever and anon sweep over a profession, as well as over a nation ; uprooting in its course abuses, now almost grown to be time-honoured customs, and leaving us all a little better, a little wiser. It is proverbially true, that one thing leads to another, and doubtless it was the improvement at one of the Schools, which, reacting on the others, has led to new Schools being founded, and to old ones building for themselves new habitations, or in some other way increasing the facilities for the learning of our "Art." We say "our Art," and this purposely, as against "our Science," for this, alas ! does not seem to share the progress of her sister, nor to attract the same attention on the part of the "authorities." Indeed the Science of Dentistry would make but little headway, if it depended alone on research in the Schools. We neither ignore, nor underrate the enormous clinical experience there gained, and its benefit on our every-day work. But we refer more directly to, we believe, the entire absence of any laboratory devoted to research into Normal and Pathological Dental Anatomy, or other matters pregnant with interest to the Dental Surgeon. This seems to us a lack of which we should be heartily ashamed, and which we should early strive to rectify. It may be, and has been urged, that at any rate practical microscopy falls within the course of study at a General Hospital ; that a familiarity with the Dental Tissues is ensured by the lecturers demons-

trating them under the microscope ; that the little that is taught is soon forgotten or hidden away in some out-of-the-way corner of the brain by the majority of men, and that more would only follow the same fate. Now, we would not for a moment under estimate the value of the information gained by the "studies" mentioned in the first two objections. But, though it is above all things necessary, that a man should have a knowledge of the "general" before he descends, or ascends to the "special," yet this does not in any way fill the need of the latter. And the practical nature of the course all too often consists merely in mounting already prepared sections. Then, again, though all should be able to recognize Dental Tissues, yet "spotting" bears about the same relationship to original research, as, say, the "Kindergarten" to the study of Logic, or of Mental and Moral Philosophy. As regards the last objection, the latter statement does not by any means follow on the former, but rather the reverse, and even if it did, we cannot but think that a man's early studies, though not kept at examination pitch, are yet not without benefit to his future work. But we confess our concern is not at this moment so much for the average man, as for the one in a thousand, who, because of his zeal and knowledge, should become Demonstrator or Curator, and who by the very essentials of his position shall be familiar with the facts and methods of ordinary work, and by this means attain the skill and the stimulus needed for original work. It may be urged, that such an one would carry out his work, Demonstrator or not Demonstrator, if there be a school laboratory, or if there be none. We do not think so. Leaving the question of convenience and expense, is not home work in the majority of cases of all too desultory a character, to lead to great results? A man wishes to read a paper, so he cuts a few sections, draws a few more or less hasty conclusions, and reads his paper. This accomplished he does little else, save to place his somewhat elaborate microscope under a glass shade, and regard it as a kind of fetish, thenceforth and forever more. The fact, that our most accomplished scientist is the son of a no less distin-

guished father, is, we take it, not simply an accident, but, in a sense, a sequence. How often the whole future of a man—his discoveries, special knowledge, and the benefit he is to his fellow-men—depends on some chance, some accident, the appointment to some post, or so forth. Darwin says :—"The voyage of the *Beagle* has determined my whole career ; yet it depended on so small a circumstance as my uncle offering to drive me thirty miles to Shrewsbury which few uncles would have done, and on such a trifle as the shape of my nose." It is almost becoming a regular custom for the discussion on a scientific paper to wind up in lamentations over the absence of scientific work among the younger men, numerous more or less true causes being usually suggested. Whether, in this respect the younger are worse than their elders we know not, but this we venture to say, that the energy wasted by men on these vapourings had been far better employed by these using their great influence to bring about some such idea as we have suggested. For this seems to us to be the very Alpha of any scheme--though later, we would gladly welcome "grants in aid" from our wealthy Odontological Society, somewhat on the lines of those already made by the British Medical Association.

A CORRESPONDENT of the *Dental Register*, who is now seemingly doing the American's modern *grand tour*, is surprised at the amount of advertising dentistry in England.—He is not the only one who is surprised. We are all surprised. Whilst perfectly aware, that they have repudiated those advertising quacks who are bringing discredit on their compatriots, we may yet appeal to the authorities in America to make such conduct, whether at home or abroad, sufficient offence to cause the withdrawal of their diploma. For ourselves, we admit our laws are most unsatisfactory, but we hope not only may these be improved but also that advertising may die a natural death as Hospital men with diplomaces become more numerous. Rather amusing is his note from Marseilles, he says :—"One evening I was watch-

ing the man on the opera house changing his glasses in his magic lantern, to project various views and advertisements on a large screen, on a building opposite. After a short time, there was thrown on the screen the advertisement of a dentist. The first view was that of a man with his jaw bandaged and seemingly in great distress ; the second, was the man in the dentist's chair ; the third, was the dentist triumphantly showing an immense tooth, supposed to have just been extracted from the man's jaw ; fourth, price-list and address of the dentist. [Rubber plates six francs.]”

ON another page we publish an account of the first ordinary meeting of the newly founded “Student's Society of the Dental Hospital of Liverpool.” These debating clubs are, we venture to state, facile princeps among the educational influences of a Hospital School. It is not so much, what a man learns at one particular meeting, he may, perchance, learn nothing ; but, it is the long train of ideas, circumstances and consequences which they are the sparks to fire. Intercourse is the great civilizer, the stimulus that excites to further efforts, it is the instructor of all. A “Students' Society” is the beginning of an intercourse, of an exchange of ideas, which, we hope, will continue throughout a man's professional life. It is an open secret, that this Society is founded somewhat on the lines of the one at Leicester Square. This parent may well be proud of its now numerous offspring, and we are sure all will join with us in wishing “God speed” to this, its youngest daughter.

ON A SUBJECTIVE SENSATION OF THE MOUTH IN WOMEN.
—Dr. A. Ogier Wald writes to the *Lancet*:—Sirs,—Dr. W. B. Hadden published, in the *Lancet* of Jan. 25th, notes of three cases under the above title. I have waited for some time in the hope of seeing notes of similar cases in the experience of others ; but either these cases are very rare, or medical men will not take the trouble to contribute their experiences. On Dec. 9th, 1889, I made the following notes

of a case of the kind, though until I saw Dr. Hadden's article I had not thought it possible that the case was out of the common except to my own limited experience. Mrs. T——, aged fifty-two, has complained for years of "bearing down pains," "opening and shutting of the back," pains in the groins, &c., and has worn various pessaries at intervals for a prolapse which has never been serious. She still menstruates, but recently the periods have come on irregularly and at longer intervals. For five weeks she has had pain on the tip of the tongue, "at first like a cold in the teeth and gums." The pain is described as a "tingling and burning." She insisted that there was a prominent spot there, but careful examination with a lens and a needle failed to show any one part more tender than another, the whole area of tenderness being about the size of a threepenny piece. The teeth were somewhat crusted with tartar, and dyspepsia has been a frequent complaint; so I directed my attention to that with some apparent success, though at the end of February she said the tongue was still tender. She has the florid colour on the malar prominences mentioned by Dr. Hadden.

HUNTERIAN SOCIETY.—*Myeloid Epulis*.—Mr. J. Hutchinson, jun., showed, at the meeting of the Hunterian Society, figures and microscopic preparations from a case of myeloid epulis, which had recurred after excision ten months previously. The structure was that of typical myeloid sarcoma, with giant cells. In the microscopic slide, nodules of bone were observed in the growth. It was commonly said that these tumours did not ossify, but he had found the reverse to be the case. The plum colour of the tumour was very characteristic.

Salivary Calculus.—Mr. Hutchinson, jun., also showed a small salivary calculus from a woman, aged about 35, who was sent into the hospital as a case of epithelioma of the side of the tongue. There was a hard mass, and as it was in the situation of Wharton's duct, he thought it might be due to a calculus, and on cutting into it he found it was so. A hard fibrous structure of about half an inch in thickness surrounded the calculus, and the glands in the neck were enlarged.

STENOSIS.—Dr. Colcott Fox exhibited, at the meeting of the London Medical Society, a case of Stenosis of the Lower Part of the Pharynx, due to hereditary syphilis. A girl of fourteen years presented a perforation of the soft palate, adhesion of the soft palate to the posterior wall of pharynx, shutting off the naso-pharynx, and a button-hole stenosis of the lower part of the pharynx about the site of the attachment of the epiglottis. The latter was destroyed, and immediately through the whole were seen the openings of the larynx and œsophagus. The larynx was healthy. The gummatous infiltration began three years ago, when there was coughing up of “phlegm” and occasionally blood. There were no other signs of hereditary syphilis in the bones, eyes, teeth, or other parts. On admission she had considerable stridor and attacks of crowing inspiration, culminating in cough. All the infiltration had disappeared under iodide of potassium, and she now swallowed and breathed with great ease. Lesions of the lower part of the pharynx and the larynx occurring as a part of so-called late hereditary syphilis were well-known, though they were not at all common. The case was interesting on account of the peculiar features of the Stenosis and its site immediately above the origin of the larynx and œsophagus.

IODOL.—Dr. David Cerna, in a short paper in the *Medical News*, gives his experience of a trial of this somewhat new remedy. He has found it to give most satisfactory results in the local treatment of ulcers, and also internally in cases of syphilis, and in one instance in diabetes mellitus. It owes its properties to the iodine it contains, and seems to act much in the same way as iodoform, but it presents an immense advantage over this drug in that it has no odour. Locally he employs it either in powder solution or ointment; solution can be made in alcohol (1 part in 3) or in ether (1 part in 4); for the ointment he recommends vaseline (1 in 5). Internally he has given as much as 20 grains in a day, but some writers give much larger doses.

Practical Hints

FOR THE SURGERY AND WORKROOM,
AND
MATERIA MEDICA NOTES.

We purpose from time to time publishing a column of these "Notes." Surely everyone will hasten to throw those "wrinkles," they value so much themselves, into a common fund for the good of all.

Although the operator says of light, "the more the better," not so the patient. To have to sit facing a bright light, especially an artificial one, during the insertion of a gold plug, is no slight task. We have all had patients complain, and have no doubt sympathized. But it seems (as far as we know) to have been reserved for Mr. Badcock to hit on the simple expedient of a pair of "blue goggles." He keeps a pair handy, which though certainly formidable to look at, are much appreciated by his patients. Try it.

The same gentleman, mindful that "Many a mickle makes a muckle," has grumbled at the gold dust lost on the "Rubber Dam." His time is too valuable to waste in collecting this, but he has now started a jar (and a very pretty one, too), into which he stuffs his rubber. When full, it is sent into the workroom, there washed, and the dust saved.

EVERY-ONE knows the "facial contortions" following the introduction of a carbolic dressing into a sensitive tooth, even though he himself may never have experienced the actual pain. It is often looked upon as a kind of struggle of the Dentinal Fibril before the escharotic gives it its *coup de grace*. Acting on this view, some men mix up with their carbolic a little cocaine. But in nine cases out of ten, it's nothing of the kind, simply and solely because the dressing's cold. Wet the pledget of wool thoroughly, then warm it in the flame of a spirit lamp, and introduce warm. This is the best anodyne

Dr. A. L. COATES recommends taking a wax impression as follows :—Heat the wax until it has about the consistency of dough, then proceed in the usual way to make the impression, pressing the wax moderately against the ridge. Remove carefully, and with a hot knife cut away the surplus wax, cool slowly, and when quite hard replace in the mouth, holding it solidly to place with the fingers, at the same time pressing hard and thoroughly against the labial and buccal aspects of the ridge with the thumbs until the gurgling of saliva ceases. Now if the impression feels tight to the patient it should be carefully removed, but should it fail to adhere tightly it should be pressed more heroically until it will remain in position without ulterior support. A re-insertion of the impression in the manner described after it has cooled, produces an astonishing successful result. This method applies especially to full cases, ninety per cent. of which can be successfully worked.—*Dental Luminary*.

FOR capping over pulps nearly exposed, simply cover the base of the cavity thoroughly with wax, then with a warmed cap of lead, tin, or gutta-percha as may be indicated, and filled with gold or amalgam as judgment may direct.—B. F. Arrington.—*The Cosmos*.

IN soldering bands to plates a great saving of time is effected by using casting sand, as an embedding material, instead of sand and plaster. It is also claimed for this, that the relative position of the band to the plate is better maintained. Mix your sand with water to the consistency of cream. Place the plate, with band waxed to it, on a pumice or arbestos block. Drop the sand round band, and a little to fix plate, much as you would with plaster and sand. The asbestos soaks up the water so that the sand “sets” almost at once. Now warm up the sand. This is most important. When that is warm, burn the wax off. Then borax and solder.

HERE IS A RIDDLE.—How many hours does a workman spend during his life, hunting for odd teeth? We opine the number would surprise most men if an estimate could be made. A tremendous saving is, however, effected, by doing away with the usual “odd box” and using wax cards, one for each form of tooth, these being stuck on them in rows, right ones on one side, left on the other. Lids of tin vulcanite boxes filled with wax, answer exceedingly well.

WHY buy expensive waved floss silk for placing ligatures round teeth, when using the rubber dam? Ordinary cobbler’s thread is very much cheaper, as strong and in every other respect as good.

DR. GUERINI’S PROCESS OF FILLING TEETH WITH WHITE CORAL.—Take a piece of coral and shape the end of it to the side of the carious cavity. Then cut a groove around it immediately above the point you want the piece to break off. Then introduce cement in the cavity, and place the piece, which is not yet detached, in the cavity; keep it until dry; then the slightest lateral motion separates the small piece, which is retained in the cavity, from the large piece; the whole surface is then equalized with a corundum-wheel, and the operation is complete. Dr. Guerini claims that this fulfils all the qualities of a good filling agent. It is easy of manipulation. A non-conductor of heat and cold. Resists the wear of mastication and the action of saliva. It neither injures the tooth nor changes colour, and is readily removed.

According to Dr. Audie-Sarzeau, camphor exercises upon iodoform a considerable solvent power. He states that whilst 10 grams of alcohol alone will dissolve at most 0.125 gram of iodoform, the quantity that can be dissolved is increased to 1 gram if the alcohol be first saturated with camphor. A similar result is obtainable with an ethereal solution of camphor.

Abstracts of British & Foreign Journals.

HYPNOTISM AS AN ANÆSTHETIC.

The *Lancet* publishes a report, of a demonstration of hypnotism as an anæsthetic during the performance of dental and surgical operations, furnished by a correspondent, on whom they can rely. Upwards of sixty medical men and dental surgeons of Leeds and district were brought together on March 28th by Messrs. Carter Brothers and Turner, dental surgeons, of Park-square, Leeds, to witness a series of surgical and dental operations performed in their rooms under the hypnotic influence induced by Dr. Milne Bramwell, of Goole, Yorkshire. Great interest was evinced in the meeting, as it is well known that Dr. Bramwell is quite a master of the art of hypnotism as applied to medicine and surgery, and is shortly to publish a work of considerable importance on the subject.

A letter from Dr. Clifford Allbutt, reminded the meeting that he remembered the time—thirty-five years ago—when Lister performed several serious operations, using hypnotism as the anæsthetic, at the hands of a scientific lay friend in Lincolnshire.

The first case was a woman of twenty-five. She was hypnotised at a word by Dr. Bramwell, and told she was to submit to three teeth being extracted without pain at the hands of Mr. T. Carter, and further that she was to do anything that Mr. Carter asked her to do (such as to open her mouth and spit out, and the like) as he required her. This was perfectly successful. There was no expression of pain in the face, no cry, and when told to awake, she said, she had not the least pain in the gums, nor had she felt the operation. Dr. Bramwell then hypnotised her, and ordered her to leave the room and go upstairs to the waiting room. This she did as a complete somnambulist.

The next case was that of a servant girl, aged nineteen, on whom, under the hypnotic influence induced by Dr. Bramwell, a large lacrymal abscess extending into the cheek had a fortnight previously been opened and scraped freely, without knowledge or pain. Furthermore, the dressing had been daily performed and the cavity freely syringed out under

hypnotic anæsthesia, the "Healing Suggestions" being daily given to the patient, to which Dr. Bramwell in a great measure attributes the very rapid healing, which took place in ten days—a remarkably short space of time in a girl affected by inherited syphilis, and in a by no means good state of health. She was put to sleep by the following letter from Dr. Bramwell addressed to Mr. Turner, the operating dentist in the case.

[COPY.]

"Burlingtou-crescent, Goole, Yorks.

"Dear Mr. Turner,—I send you a patient with enclosed order. When you give it her, she will fall asleep at once and obey your commands.

"(Signed) "J. MILNE BRAMWELL"

[COPY]

"Go to sleep by order of Dr. Bramwell, and obey Mr. Turner's commands.

"J. MILNE BRAMWELL."

This experiment answered perfectly. Sleep was induced at once by reading the note, and was so profound that at the end of a lengthy operation, in which sixteen stumps were removed, she awoke smiling, and insisted that she had felt no pain; and, what was remarkable, there was no pain in her mouth. She was found after some time, when unobserved, reading the *Graphic* in the waiting-room as if nothing had happened. During the whole time she did everything which Mr. Turner suggested, but it was observed that there was a diminished flow of saliva, and that the corneal reflexes were absent; the breathing was more noisy than ordinary, and the pulse slower. Dr. Bramwell took occasion to explain that the next case, a boy of eight, was a severe test, and would not probably succeed; partly because the patient was so young, and chiefly because he had not attempted to produce hypnotic anæsthesia earlier than two days before. He also explained that patients require training in this form of anæsthesia, the time of training or preparation varying with each individual. However, he was so far hypnotised that he allowed Mr. Mayo Robson to operate on the great toe, removing a bony growth and part of the first phalanx with no more than a few cries towards the close of the operation, and with the result that when questioned afterwards he appeared to know very little of what had been done. It was necessary in his case for Dr. Bramwell to repeat the hypnotic suggestions. Dr. Bramwell remarked that he wished to show a case that was less likely to be perfectly successful than the others, so as to enable those present to see the difficult as well as the apparently easy, straightforward cases.

After a case operated on by Mr. Bendelack Hewetson, Mr. Turner extracted two large molar teeth from a man with equal success, after which Dr. Bramwell explained how his patient had been completely cured of drunkenness by hypnotic suggestion. To prove this to those present, and to show the interesting psycholological results, the man was hypnotised, and in that state he was shown a glass of water, which he was told by Dr. Bramwell was "bad beer." He was then told to awake, and the glass of water (so-called bad beer) offered him by Dr. Bramwell. He put it to his lips, and at once spat out the "offensive liquid." Other interesting phenomena were illustrated and explained by means of this patient, who was a hale, strong working man.

Mr. Tom Carter next extracted a very difficult impacted stump from a railway navvy as successfully as the previous case. Dr. Bramwell described how this man had been completely cured of very obstinate facial neuralgia by hypnotism. The malady had been produced by working in a wet cutting, and had previously defied all medical treatment. On the third day of hypnotism the neuralgia had entirely disappeared (weeks ago), and had not returned. The man had obtained, also, refreshing hypnotic sleep at night, being put to sleep by his daughter through a note from Dr. Bramwell, and on one occasion by a telegram, both methods succeeding perfectly.

At the conclusion votes of thanks were given to Dr. Bramwell and Messrs. Carter Brothers and Turner.

ARCHIVES OF DENTISTRY.

WHITE CHLORA-PERCHA.

Dr. Patterson thought the subject of root filling the most important before the profession to-day. He desired to direct attention to an improved solution of gutta-percha for filling root canals. The great majority of operators use red base-plate gutta-percha; but a much better solution is made with the white gutta-percha filling material, which has less shrinkage than the red. In crooked canals he uses this solution almost exclusively, sealing the apex, and filling the apical third or fourth of the canal. It is bad practice to force the filling material beyond the apex. Oxychloride of zinc is the best filling for the remainder of the canal. He finds no

trouble in forcing it to any part of the tooth, and he then feels that the organic material is placed in a better condition than by any other method. Roots filled with gutta-percha, when cut open, have more odour than those filled with oxychloride.

PORCELAIN INLAYS.

ARTHUR STODDARD.—I believe the manufacturers now furnish small pieces of porcelain which may be ground into shape; but I think one, with the conveniences at hand, would find that it requires less time to bake one than it does to select one from stock and grind it into shape. As briefly as possible, I will give the method which we employ. There is nothing particularly novel about it to one used to porcelain work, but it seems to me that it is the most practical in all cases, that I have yet seen. Shape the cavity to general form desired, without making any undercuts. Leave the more careful trimming until the time for fitting the filling into place. Take an impression of the cavity with Ash's modelling compound, using it in a stick the form of a pencil. Warm one end over a small flame, and thrust it into the cavity, taking care to get an accurate impression of the parts of the tooth immediately surrounding the cavity, as well as the cavity itself. The colour is now selected from the sample colours. Each sample corresponding in number to a body of that number. In this manner there is a certainty that the body, when baked, will be of the colour desired. Cast the impression without oiling it, and use the plaster of Paris very thin. In this manner an accurate model of the tooth and cavity may be obtained. After separating, trim the margin of the cavity in the plaster model, till it is slightly larger than the cavity in the natural tooth, to allow for shrinkage in baking, and make a slight undercut. Then mix the body of the desired number to the consistency of cream, pack into the cavity in the plaster model until full, and cover with a thin coating of enamel. Place in the gas furnace, bake about two minutes. This biscuits the filling so that it may be removed from the plaster, otherwise, the model would melt when subjected to the intense heat in the furnace. Continue the baking for about six minutes longer, and the filling is fused. When cool, it may be ground into place, set and polished in a surprising short time. The manner of setting being virtually the same in all methods.

THE CANADIAN PRACTITIONER.

A CASE OF FOREIGN BODY IN ŒSOPHAGUS.

Under the care of LACHLAN M'FARANE, M.D.,
in Toronto General Hospital.

The patient one morning, while at work, somewhat hurriedly took a drink of water. While swallowing, a plate with an artificial tooth attached became dislodged from the roof of his mouth; the first intimation he had of the dislodgement of the plate was that immediately after swallowing the water he felt something sticking in his throat, and at the same time observed that the plate was no longer in the roof of his mouth. He went immediately to a doctor, who, with the assistance of another practitioner, passed an umbrella probang, but did not succeed in doing any good. Dr. McDonagh then saw the patient; he examined with the laryngoscope, but failed to discover anything abnormal: a probang with a bulbous extremity was then passed into the stomach, and during withdrawal a foreign body was detected at a certain point; a grating sensation was felt. Located by measurement, it was eight and a quarter inches from the upper limit of the œsophagus. Œsophageal forceps of various kinds were introduced into the gullet; during one of these attempts the foreign body was seized, but the patient grasped the doctor's hand and forced him to relinquish his hold; all subsequent efforts to seize the body with forceps were unsuccessful. The operation of œsophagotomy was undertaken fifty-three hours after the patient had swallowed the plate. The wound made was explored with the finger, and at the lower angle a foreign body was detected lying in the gullet; this was distinctly felt and was apparently fixed in position. A scalpel was introduced and an incision made into the œsophagus, cutting down upon the foreign body, and by this means an opening was made a little more than an inch in length; the tooth was then felt projecting into the lower angle of the wound; this was seized and some traction made upon it, but the plate was not dislodged; the plate was then grasped by its superior margin and rotated on its antero-posterior axis, so that little by little it was rolled out from position. It was not thought advisable to suture the opening in the œsophagus. The plate had been fifty-three hours in the gullet and was firmly impacted, so that probably some extent of damage had been done to the

œsophageal wall, and it was consequently thought safer to leave it open. During the subsequent history of the case, the most noteworthy point is the way in which the act of swallowing could never be completed without forcing out the contents of the gullet into the wound. It was attempted at one time to pass a stomach-tube and so to feed the patient ; but he resented the attempt so strongly that the thing was abandoned as impossible. For a time he was allowed soft food by the mouth, the enemata being stopped, but invariably some of it came through the wound. On the fifteenth day after the operation the nutritive enemata were resumed and for three days he had absolutely nothing by the mouth. The wound gave no further trouble, and a complete cure resulted.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

ORDINARY MONTHLY MEETING, held March 3rd, 1890, Mr. Felix Weiss, L.D.S., President, in the chair.

THE minutes having been read and confirmed,

Messrs. M. J. Bloom, R. E. Wood and J. H. Reinhardt were balloted for and duly elected.

The Librarian (Mr. Ashley Gibbins) reported the receipt of the usual Journals and two books from the United States Department of Agriculture, one of which was on the North American Fauna.

The Curator (Mr. Storer Bennett) announced that he had received two specimens for the Museum. Mr. Morton Smale had presented a tooth which occupied the position of a right lower wisdom, in a lady aged about thirty-five. In appearance it was like a sphere about three quarters of an inch in diameter, to the posterior surface of which a mass of enamel and dentine was attached, looking like two geminated teeth above, but the roots were seen to be fused into one mass when viewed from below, in fact the mass was a very interesting odontome.

The second specimen was that of a mummy cat's skull, one of a consignment recently received from Egypt, and which were stated to be 4,000 years old. The ancient Egyptians regarded cats as sacred animals, and after death their bodies

were embalmed with great care—hence their present state of preservation.

It was suggested that if the specimen were macerated it would enable an interesting comparison with the skulls of cats living at the present time, so that one might observe the changes, if any, which have taken place during these 4,000 years.

Mr. Bland Sutton had only just had an opportunity of examining Mr. Morton Smale's odontome, and if it were not too late would like to say that he regarded it as extremely interesting : he knew of none like it, and would suggest that it should be cut in two parts, and illustrated in the *Transactions*. With regard to the cat's skull, he would also make a suggestion, viz., that it should be macerated and the Curator should be requested to compare the dentition with that of a modern cat.

Mr. David Hepburn, referring to the odontome, stated that Mr. Smale had shown it to him some time previously, and he (Mr. Hepburn) thought it a *left* lower wisdom tooth, partly from the curvature of the fangs, and partly because he had met with a similar case in a lady who had suffered from facial neuralgia for many months. When examining her mouth he thought it as well to examine very carefully this peculiar left lower wisdom tooth. On the buccal aspect it had a little accessory denticle ; on probing it the whole of the surface yielded, and the accessory tooth seemed to collapse, showing exposed nerve. He cut off the denticle with an enamel chisel ; filled the cavity with gutta percha, and relieved the neuralgic pain. It seemed to point to one fact, viz., that these little denticles were possessed of abnormally large pulp cavities ; he would therefore endorse Mr. Bland Sutton's suggestion.

Mr. Storer Bennet wished to be allowed to say that he stated the tooth to be a right lower wisdom on the authority of Mr. Morton Smale, who extracted it. He would remark that it was a very interesting tooth ; he presented one to the Museum some three or four years ago, which was smaller but anatomically like it.

Mr. David Hepburn would only add that the fangs were tending in a direction which suggested the tooth came from the left side, and as Mr. Morton Smale concurred with him at the time in regarding it as a left and not a right wisdom tooth his later description was possibly an inadvertent slip.

Mr. W. F. Henry made a "Casual Communication" on the subject of "Shell Corners for Restoring Defective Teeth," and remarked that his communication was rather of the nature of a suggestion. He had no doubt that they had all had patients who expressed a great objection to contour fillings in gold. The question arose, how were these objectionable fillings to be dispensed with? He had tried oxyphosphate and replaced with porcelain, but he found that unsatisfactory. He had been under the impression that porcelain corners were made by dental manufacturers, but on enquiry he found that that was not the case. Mr. Henry showed plaster models illustrating his idea, and said that the corners might be fixed on with white cement, and if a strong support was necessary, that might be given with wires, as in the case of a gold filling. His object in bringing the matter forward was to elicit an expression of opinion from the Society, and possibly, by ventilating the subject, induce the manufacturers to turn their attention to it.

The President remarked that these little shells were not difficult to manufacture, nor were they altogether new. He remembered Mr. Robinson introducing something similar many years ago. The difficulty was to get them to be permanent. He thought the suggestion might be carried out, and that shell corners might become useful.

Mr. James Stocken said that on more than one occasion he had taken pieces out of ordinary porcelain teeth and fitted them into their place with osteo stopping. He found it answer exceedingly well. It was impossible to detect the fixture, and he had seen one that had lasted three or four years, without giving signs of wanting renewing.

Mr. F. J. Van Der Pant (Kingston) showed models, and remarked upon a case of non-eruption, which he regarded as somewhat singular. The models were taken from the mouth of a boy aged fourteen. In the lower jaw the posterior bicuspids, permanent canines on the right side, and central incisors were absent; one temporary incisor was standing. In the upper jaw both permanent lateral incisors were wanting, and the deciduous canine stood distally to the permanent canine on the left side—that he also regarded as somewhat singular. He had great pleasure in presenting the models to the Museum.

Mr. Charters White observed that the case was a very interesting one. Occasionally such cases came before most practitioners, and the parents were anxious to know what was

going to happen. Mr. White had a similar case the previous week, and the only comfort he could give the parents was that the teeth were probably somewhere, and would eventually come down. He had a lady patient, aged fifty, wearing an artificial denture, who erupted a canine under the plate.

The President said that the eruption of teeth late in life was not at all exceptional.

Mr. J. Ackery showed models of cases of non-eruption in a family, and briefly mentioned the facts in connection with them. His intention to report the cases was rather suggested by Mr. Van der Pant's case. It was some years ago since he saw the patients, and took the models, which were in some respects rather imperfect. The eldest girl in the family had only two lower incisors; the eye teeth were perfectly regular and normal. The second member of the same family had three lower incisors between the canines. The third daughter had only two incisors, and resembled the case of the eldest girl. The mother at the time said she knew of no peculiarity either in her husband or the family. But being interested, she had since examined her husband's mouth, and found that he had only three lower incisors. As the lady had set him right in the numbering of the models, and was evidently a more than usually clever and observant woman, Mr. Ackery thought that every reliance might be placed on her statement. With regard to the fact of missing incisors in the lower jaw, the records seemed to be very few, and there seemed to be no such abnormality in the Museum, except in those cases where many of the teeth were absent. As far as the children, whose cases he had cited, were concerned, they had been under his care for some years, so that there was no suspicion of any teeth having been extracted.

Mr. F. J. Van der Pant having asked if there were any peculiarity in the upper jaw,

Mr. Ackery stated there was none, but there was one peculiarity in the lower jaw he might mention, viz., the canines partook of the same character as the incisors.

Mr. F. J. Bennett suggested that a possible explanation of the presence of the canine-like tooth next to the central incisor might be that, from the persistence of the temporary canine, the permanent canine glides into the place of the permanent lateral incisor.

Messrs. T. Charters White and J. Bland Sutton then read their paper on "Observations on the Structure and Development of Ovarian Teeth." [See page 342.]

THE MANCHESTER ODONTOLOGICAL SOCIETY.

THE usual monthly meeting of this Society was held on Tuesday evening, March 4th, at the Grand Hotel; Mr. William Headridge, President, in the Chair.

Mr. F. Nattrass, L.D.S. Glas., was balloted for and elected a member.

RESIGNATION OF THE SECRETARY TO THE COUNCIL.

Mr. Simms said all would regret that Mr. Skipp had felt obliged to resign the Secretaryship of the Council. The Council had elected him (Mr. Simms) to succeed Mr. Skipp, and Mr. E. P. Collett to succeed himself as the Secretary to the Society.

The President said, they would all very much feel the resignation of Mr. Skipp, for he was a gentleman who had filled his office with admirable tact. Every one, who came in contact with him, found him up to the mark in a business point of view, and he hoped his successor would follow in his footsteps. He then called upon Dr. Shaw to move a resolution, which was as follows :—

Resolved,—That the members of this Society beg to record their regret at the resignation of Mr. G. N. Skipp as Secretary to the Council, and to cordially thank him for the efficient manner in which he has discharged his duties.

In support of this resolution, Dr. Shaw said, that all were well aware of the excellent manner in which Mr. Skipp had discharged his duties. (Hear, hear.) It would be, in his opinion, impossible to find any member of the Society more efficient than Mr. Skipp; and when he said that, he believed he was paying him a high compliment, for his predecessors had been gentlemen eminently fitted for the office, and had done their work in a manner that was most gratifying.

Mr. G. G. Campion seconded the resolution, and said he was glad to have the privilege of doing so. As one of the previous secretaries of the Society he could echo what Dr. Shaw had said, and he would add, that any one who knew the work of the secretary would agree that Mr. Skipp had carried out his duties in a most efficient manner.

The resolution was then passed with acclamation.

CASUAL COMMUNICATIONS.

Dr. Shaw said he would like to call attention to the report of the Commission, appointed by the Nizam of Hyderabad, on Chloroform. He did so because he thought it important that attention should be called to this report, and also for reasons connected with the proceedings of this society. Perhaps it would be remembered that some few years since, he made some observations to the effect that, in the administration of anæsthetics,—particularly the gas,—attention to the breathing was a matter of the highest importance; and he then endeavoured to explain the mode of regulating the breathing so as to produce the least danger. His suggestions were so counter to popular notions and practice that they were received with some surprise. But he was himself surprised at the time, that what seemed to him so obvious was not understood by every member of the profession who administered the gas, for he thought there had been sufficient reasons for thinking that anæsthetics were more dangerous, from the effect upon the breathing than from any other cause. When chloroform was first introduced he had made many experiments with it, and in all cases of death in animals he found it was from asphyxia. Almost immediately after the introduction of chloroform there arose an opinion that the chief, if not only, danger in the use of that agent lay in the effect it produced upon the heart. He knew how indisposed many were to accept any contrary view, but he believed it would be difficult to justify the very strong view that had been held, and which was yet advocated. Holding the position he did in the introduction of the gas into practice in England, it became necessary, in face of the head shakings and warnings that were then indulged in, to carefully watch the action of the heart. He did that most carefully in every case for two years, and in most cases for a longer period, and he had never found the gas affect the heart in an alarming manner. What might have been the case if it had been given when the patient was hysterical, and the breathing was not normal, he could not say. Moreover, he had come, long time since, to the conclusion that there was more danger in performing a difficult operation on a patient with weak heart without an anæsthetic than with one. These views have been strengthened by some experiments performed by the commission, or the two commissions, to which he had referred. The first commission went to work in a very thorough man-

ner, but its report was quite opposed to the prevailing opinion as to the effect of chloroform upon the heart. When this report became known in England it was disputed, and eventually Dr. Lauder Brunton, a gentleman who had, he believed, committed himself to the popular opinions, was induced to go out to India and help form a second commission. The report of this last commission is, like the first one, to the effect that chloroform does not cause death from sudden stoppage of the heart, and has no power of increasing either shock or syncope during operations. It naturally follows that those, who have committed themselves so strongly to the opinion that chloroform is such a great danger to the heart, are not going to be convinced,—for the present, at least. And it is not surprising that ingenious reasons are given for disputing the conclusions of this Indian commission, although aided by so eminent a man as Dr. Brunton. Vested interests in opinions die as hard as other privileges.

When chloroform was first introduced he (Dr. Shaw) began to use it in small doses for tooth extraction; and he had used it in this manner ever since. He wished particularly to explain that he never put the patient anything like fully under the effects of the agent except he employed an experienced chloroformist, and that the effects produced by the chloroform, as he used it, was even less than the effects of the gas. And he had no hesitation in saying that, after forty years of experience, it was an agent that would produce all the effects required in tooth extraction, except in rare cases where, owing to the timidity of the patient, entire unconsciousness must be produced. There was a theory that a little chloroform was even more dangerous than a good deal; but his experience had led him to believe that a little chloroform, administered in the cautious and limited manner that he had indicated, was as safe as any anæsthetic could be, and he would like to find the members of the society profiting by the results of his long experience.

Mr. G. G. Campion thought he would not like to have it go forth that, as a whole, this society endorsed what had been said by Dr. Shaw, for he did not agree with much that he had said. In regard to the value of the experiments in India upon animals, it was quite true that upon hundreds of these experiments the result had been that death had been due to failure of the respiration, but he did not think that proved very much, for whatever was the result upon animals it was quite possible it might have very different effects upon human beings.

There had been several cases where death from chloroform had occurred from failure of the heart's action, and not from respiration. He (Mr. Champion) would like to call attention to a discussion upon Dr. Lauder's paper, read before the Medical Society of London, at which several of the most experienced anæsthetists stated that, although they believed Dr. Brunton was right in regard to his experiments with animals, they declined to form any conclusion or opinion as to the general results of chloroform upon human beings. If it could be shown that in some cases chloroform had produced death by affecting the heart, then one clinical observation of that kind was worth thousands of experiments upon animals. He saw in the correspondence columns of the *British Medical Journal*, a few weeks since, a statement made by a gentleman who said, he had looked up the record of deaths under anæsthesia at the St. Bartholomew's Hospital during the past year and he found the deaths from chloroform just about double what they were from ether, which went to disprove that chloroform was as safe as Dr. Shaw had described. In regard to the opinion that a small quantity of chloroform was more dangerous than a larger one, he would observe that opinion was formed by Dr. Lauder Brunton upon certain clinical observations. In conclusion, he said, he would be sorry to adopt Dr. Shaw's advice to give chloroform, and he hoped it was not a practice which would be adopted by the members of this Society indiscriminately.

Mr. Simms said the matter was a most interesting one ; but he hardly thought that chloroform was as safe to use as Dr. Shaw had stated, and he fancied there was a scientific reason why a small quantity of chloroform was more dangerous than a larger one. He suggested that the subject be again discussed at some future meeting.

Dr. Shaw, in reply to Mr. G. G. Champion's remarks, referred to the tone that gentlemen had seen fit to adopt, and suggested that the members of this Society were intelligent gentlemen who were capable of forming their own opinions, and would act upon them when formed. He repeated, that he had used small quantities of chloroform with great success, sometimes merely applying it to the gums, ever since he had been in practice, and he thought his experience was worth something.

The President, after complimenting Dr. Shaw on the clear manner in which he had presented the subject, gave some of his own experience with chloroform, and hoped Dr. Shaw

would give them some statistics of cases where he had used chloroform in the manner he had indicated.

Dr. Shaw replied that he had no records of the cases within recent years, and would probably not refer to the subject again.

The President then called on Mr. Collett for his paper on "Copper Amalgam," its advantages and preparation. [See page 337.]

In the discussion which followed :—

Mr. Molloy said he was rather surprised to find that copper amalgam was a soft filling, as he had always thought it made a hard one.

Dr. Shaw said, in regard to the discolouration of the tooth by a copper amalgam, that at one of the American societies the question had been raised if it was not caused by the mercury coming to the surface of the filling when it was packed into the tooth.

Mr. Simms said that he was struck with the fact that in America they were beginning to find out the value of copper amalgam. He agreed with the use of this filling, and knew of one case where a tooth had been so filled for forty years.

Mr. G. G. Campion said, he would like to ask Mr. Collett what ink he used in his tubes. Was it a true solution, or was it simply matter in suspension? Then a copper amalgam shrank, while an alloy would not do so.

Mr. Broughton mentioned a case, which had come under his observation, where copper amalgam had been more serviceable than gold fillings.

Mr. Collett, in reply to several questions put to him, said he had used "Lyon's" ink because he thought it was a solution. In regard to the discolouration, he lined the cavity with fossiline so it would not show through. The shrinkage made no difference, for where the moisture got at the filling it seemed to oxidise. He thought one of the chief values of copper amalgam was its antiseptic properties.

The meeting concluded with a vote of thanks to Mr. Collett for his able paper.

Gretschinsky has found a decoction of the bark of *Rhamnus catharticus* gives complete cessation of the pain when introduced into a carious cavity on a bit of cotton. He directs ten parts of the bark to be boiled in a quantity of water which, after standing, will leave twenty parts of liquid, to which one part of alcohol is to be added.—*Ther. Analyst.*

STUDENTS' SOCIETY OF THE NATIONAL DENTAL HOSPITAL.

THE last Ordinary Meeting of this Society was held on Friday, March 7th, at 8 p.m. P. W. Grutham, Esq., President in the Chair.

The minutes of the previous Ordinary Meeting were read by the Secretary and confirmed.

The Misses Brierly, and Mr. Schelling were present as visitors, and received the usual form of welcome from the President.

CASUAL COMMUNICATIONS.

Mr. E. G. Carter showed the model of a mouth having a supernumerary tooth in the position of the left upper central, which was however in range, though pushed very much on one side.

Mr. Carter showed some trays for crown work.

Mr. Clements exhibited a lower canine having two roots.

Mr. Perks showed a malformed second upper molar also the model of a patient's mouth, illustrating arrested eruption.

The patient who is 45 years of age, has only recently erupted her left upper canine.

Mr. Rushton read a communication from Mr. Lankester relative to the system of teaching Dental Surgery, in Philadelphia.

The President then called on Mr. Keevil for his paper entitled "The Physiology and Treatment of Sensitive Dentine." [See page 350].

STUDENTS' SOCIETY.—THE DENTAL HOSPITAL OF LIVERPOOL.

First Ordinary Meeting, held 19th March, 1890. R. Edwards, Esq., President, in the Chair.

Proceedings opened with the Presidential address. After giving a few illustrations of great results following small beginnings, the President congratulated the Society on this, its first meeting, though it was small in point of number and social influence. He urged the necessity of diligence and application, if the Society was to realise its highest object as a means of education. By reference to the biographies of

two or three self-made men, he gave practical illustration of the power of perseverance. He enjoined all students to avail themselves of every opportunity to exercise the art of public speaking. In conclusion, he thanked the members for the honour they had done him, and assured them, that it would be his constant endeavour to do all in his power to further the interests of the Society.

Mr. Mansell then showed some abnormal wisdom teeth. Mr. Phillips an old "Gas Book" with particulars of several cases. Mr. Fred. Dopson a set of teeth made by an amateur, of gold, with tube teeth rivetted, and fixed to the gums with gutta percha.

The President then called upon Mr. Lewis Osborn for his paper on "Anæsthetics in relation to Dental Surgery," (See page 347). After which a long discussion took place, in which Messrs. Phillips, Roberts, Bates, Mansell, Dunlop, Pidgeon, Hitchom, and Gilmour joined.

The meeting closed with a vote of thanks to the President, who announced that the next meeting would be held in October.

Dental News.

The last Smoking Concert of the National Dental Hospital this season took place on Thursday, March 27th, at the Portman Rooms, Baker Street, W., under the genial chairmanship of the Dean of the School. About 160 were present, amongst whom were Drs. Hill and Waller, of St. Mary's, Mr. W. H. Ash, and nearly every member of the staff.

The programme, which included nearly every variety of entertainment, was received with hearty applause, particularly the contributions of Messrs. Genet, (recitation), A. and H. Kelvey, (banjoists), McLean, (musical sketch), Pearce, (Legerdemain), Prager, (impersonisation), Bluff, Joyner, May, and Alfred Smith.

The Chairman took the opportunity to announce the generous offer of Messrs. Ash and Sons, to award an annual money prize of £3 3s. to the Students of the College for a paper on Dental Surgery, the competition to take place during the Winter Session.

The supporters of the Exeter Dental Hospital held their annual meeting at noon, on March 27th, at the Exeter Guildhall, under the chairmanship of the President, Mr. W. H. Ellis. There was a moderate attendance, and letters regretting their inability to be present were read from several influential persons. In their tenth annual report the committee stated that in the past year 4,938 cases had received attention, as compared with 4,605 the previous year, thus showing that the usefulness of the institution continued to be appreciated by those for whom it was intended. The income for the past year was £139 2s. 3d., as compared with £172 5s. 2d., in the former year, and the expenditure £152 8s. 5d., as compared with £185 19s. 10d. in 1888. The balance due to the treasurer had been increased from £9 5s. 6d., at the end of 1888 to £22 11s. 8d. at the end of 1889. A further sum of £10 has been paid on account of the expenses of removal to the new premises in 1887. There was now a balance of £27 due on this, which, together with the adverse balance of £22 11s. 8d., made the Hospital in debt to the extent of £49 11s. 8d. The Committee acknowledged several donations, and as the institution had recently lost several of its subscribers by death, they appealed for new annual subscriptions to meet the current expenditure, and also a few donations to free the hospital from debt. They recommended the re-election of the President (Mr. W. H. Ellis), the retiring members of the Management Committee (Messrs. W. S. Mortimer, W. J. Petherick, and Major-General Saxton), and also of the hon. treasurer (Mr. F. Townsend). In conclusion, the committee thanked the hospital staff and the auditors for their services. —The adoption of the report was moved by the Chairman, the Sheriff, (Mr. E. B. Sanders) seconded, Archdeacon Barnes supported, and the motion was unanimously agreed to.—The usual vote of thanks brought the meeting to a close.

We regret to notice the death of Carl Friedrich Mallachow the "Senior der Deutschen Zahnärzte." He was born in 1797, and in 1813 took part in the campaign against Napoleon. He then studied medicine and dentistry. From 1825 to 1830 he practised at Bronberg, and from then to 1886 at Posen. At 89 years of age one is not surprised to hear he retired, and went to live with his son. He passed peacefully away.

The donation of £100,000 made through Sir William Savory towards establishing a convalescent home for patients from London general hospitals has been increased by another anonymous donation, this time of £50,000. An estate of 50 acres, about 15 miles from London, has been provisionally selected as the site. At least £300,000 to £400,000 will be required.

The Venetian fête, concert and ball in aid of the building fund of the Dental Hospital of Ireland realised £2573 net gain.

The need of a Royal Commission on the working of our Hospital system has attracted the attention of the Charity Organisation Society. It is felt that most of the £100,000 now spent in appeals might, under a better system, go to the patients.

According to a paragraph from Dalziel's Berlin Agency published in an evening paper, by direction of the Privy Council, a census is being secretly taken of the number of doctors possessing American college degrees practising medicine and dentistry in the Empire. It is the intention of the Government to interdict the carrying of an American doctor's degree, a title assumed here principally by dentists. In German colleges there is no such degree as "Doctor of Dentistry," consequently many German students matriculate at an American university, generally in Philadelphia, Baltimore, or New York. They graduate with the degree of D.D.S., (Doctor Dental Surgery), and returning to Germany place the prefix "Dr." on their door-plates. This is no longer to be permitted, as it is regarded as misleading to patients; an American medical degree being considered as next to valueless in Germany. In Berlin at present there are twenty-six German dentists with American diplomas. Their licences will be taken from them unless they call themselves plain "Mr."

THE Musical Society, that hails from the Dental Hospital of Leicester Square, has been doing valiant service this winter at the entertainments at various Hospitals and other Charities. It is certainly very pleasant to hear, that the services have been thoroughly appreciated. The last effort for the season,

(so far as is known) was at the Cancer Hospital, Brompton, at an entertainment to the in-patients, given by the Misses Marsden. What with glees by the Society, songs by Messrs. D. Hepburn, Wheatley, Smith, etc., and quartets by Mrs. Underwood with Messrs. Smith, Underwood and Hepburn, the Society seem to have filled the larger part of the programme. It was a very jolly evening, and we hope will long linger in the memory of these poor sufferers, the victims of that fearful disease.

A dentist is now being charged in Berlin with being the cause of a young man's death, whom he had given Bromide of Ethyl followed by a few drops of Chloroform. The patient recovered, but the same evening fell ill and died on the following. Dr. Levin was called as witness, and believed it to have been the cause of death, though he granted that Bromide of Ethyl quickly passed out of the body, and was the safest of all anæsthetics. Opposite views were taken by other witnesses.

THE EDINBURGH DENTAL STUDENTS SOCIETY DINNER.

The sixth Annual Dinner of this Society was held in the Windsor Hotel, Princes Street, Edinburgh, on the evening of the 7th ult. Mr. J. S. Amoores L.D.S. Eng. the Hon. President for the ensuing session presided, and Mr. Turner L.D.S. the Society's President acted as croupier. After the loyal and patriotic toasts the chairman proposed "The Edinburgh Dental Students' Society," the response being in the hands of the croupier. "Kindred Societies" was most ably replied to by Mr. Rees Price, L.D.S. Eng., his position of sponsor, conveying an expression of good fellowship from similar societies being warmly applauded by the Students. Other toasts were, "The Edinburgh Dental Hospital," "The Lecturers," "The Guests," and "The Chairman." The menu card, as in past years, was designed by one of the members, and was in no wise inferior to its predecessors. Songs, pianoforte solos, and other sources of enjoyment varied the proceedings, and altogether the dinner committee are to be congratulated on the pleasant evening they provided to over forty gentlemen.

British Journal of Dental Science.

No. 535. LONDON, MAY 1, 1890. VOL. XXXIII.

TREATMENT OF IRREGULARITIES OF THE TEETH.*

(Illustrated from cases in practice.)

By MR. JOHN BIGGS, L.D.S. Glas.

Mr. Chairman and Gentlemen,—At present I purpose not so much to enter into the etiology of irregularities of the teeth, as to deal with the practical aspect of the subject, illustrated from models in various stages, and with the apparatus used from the beginning to the completion of each case.

Before commencing the subject proper I would like to remark, the great diversity of opinion there seems to be as to the influence for good or evil in the early extraction of the deciduous teeth. On the one hand, it is advocated that the early removal of the deciduous teeth prevents crowding of the permanent ones. On the other, it is contended that such a procedure causes contraction of the jaws, and consequent over-crowding of the permanent set. My own experience is that infinitely more harm is done by too great haste in their removal, than by an error in the opposite direction. I certainly would not hesitate to remove a temporary tooth when I had sufficient evidence that it obstructed the permanent ones, and who has not seen even a tiny spicule suffice to divert a strong well-developed tooth from its normal position, as if it were there to dispute possession, and maintain the truth of the adage, that possession is nine points in the law. Yet I am not of opinion that extraction causes contraction of the jaws.

At an age when room for the permanent set might be deemed desirable, there are so many tooth germs, at all stages of development, hastening on to their destined goals, that I maintain there are sufficient factors present to promote the growth of the jaw, and that contraction is unlikely. I hold it more probable that extraction, for instance, at the age of from five to six, arrests the development of the alveolar pro-

* A Paper read before the Odonto-Chirurgical Society of Scotland.

cess, until further demands stimulate it into new efforts. This is well exemplified in the case of a six-year-old molar removed. You will find nature has rather utilised the material already provided than exerted herself to produce it anew.

I pass round for your inspection the model of the superior maxilla of a young lady, aged 20. You will observe the bicuspidis on one side almost touch those on the other ; they are exactly five-sixteenths of an inch apart. With the model in your hands it is not difficult to define the reason for their displacement. The temporary molars were removed at so early a period, that the six-year-old molars were compelled to occupy their position. Consequently, when the bicuspidis appeared, they were forced, for want of space, to occupy the position they now maintain. Of course if this case had come into my hands sufficiently soon, it would have been an easy matter to correct it. But the young lady lives at a considerable distance, her general health is not robust, and she is inclined "rather to bear the ills she has than fly to others that she knows not of."

Her appearance is in no way impaired, she suffers no pain, and is not easily convinced that her general health may be impaired from the defective occlusion, as shown by her models, but rather looks forward to the time when she may rid herself of them all, and get others more beautiful, though less natural.

This is only one example of many similar cases where the symmetry of the mouth, and even the features, has been destroyed by this injudicious and premature extraction of the temporary teeth. So much, then, for the theory that early extraction of the deciduous is beneficial to the permanent teeth.

Again, I have heard it stated that the extraction of the six-year-old molar for a young person hinders the development of the sphenoid bone, stunts its growth, and thereby lessens the capacity of the brain case, and of course impairs functional activity of the brain. But I am of opinion that the sphenoid, the bodies of the maxillæ, and the adjacent bones, having independent developments, are capable of achieving normal dimensions, despite the existence of the teeth or the alveolar process, which may in a measure be considered an afterthought of nature, and not independent formations, like those just specified.

I will now, without further digression, proceed with my subject proper. I have here the model of a boy's superior

maxilla. You will see a somewhat unusual form of irregularity. The right central has been thrown forward so much as to allow the lateral incisors to occupy its place in line with opposite central. The model is accompanied by the appliance by which the irregularity was corrected. It is a vulcanite plate, filling the palate from molar to molar and forward to the incisors. You may observe the teeth are short, and poorly adapted for anchorage. I have, therefore, a wire round the molar on the left to make it fast there. On the right you see a long wire reach from the bicuspid round to and in front of the incisor. These wires are made of piano wire, and have a good reliable power. In front of the bicuspid there is a small ring of gold spring, to which a rubber band is attached. When in situation the band was stretched over the lateral, and the spring over the central. The lateral was drawn clear, and the central pushed back into position, a distance of over a quarter of an inch in the course of one month, much to the gratification of the boy and his parents.

The models I now place in your hands are those of the inferior and superior maxilla of a young lady, age 12. I think it obvious that the abnormal condition here maintained is hereditary. This is a somewhat common type of irregularity, and one most difficult to correct. In the first place, you may observe that there is a defect in both jaws. The lower is small and receding, while the upper is prominent, causing a space between the lower and upper front teeth, when occluded, of fully half an inch, in addition to which the teeth in the upper are acutely V-shaped and the canines stand forward in front of, and covering half the breadth of the laterals. The patient had quite a difficulty in closing her lips, and altogether an unsightly deformity was produced.

One of the great difficulties with this case was the shortness of the back teeth, the molar on the right side being only about a sixteenth of an inch above the surface of the gum, the first bicuspid about an eighth of an inch, and the second not erupted at all. The molar on the left is about an eighth, but the bicuspid fairly well developed. Such an arrangement you can readily see was not at all favourable for anchorage. However, a very accurately fitting plate was struck up for it, with a small loop of wire, soldered behind each central for the application of elastic bands, and a tube with a female screw, fitted and soldered behind each lateral, for male screws to push out the laterals. For the left bicuspid there were

caps fitted to be cemented on, and square tubes were soldered to them, and for their accommodation there was a strong bar soldered to the side of the plate, on which they work backwards and forwards, the motor power being elastic bands fastened on cross-bars and to a ring at the back of the plate. On the right side the square tube was soldered to the plate, and the square bar made to slide in it for the retraction of the cuspid. By this device the teeth were brought fairly well in to their positions. A retaining plate was then made, consisting of vulcanite, with a piano wire encircling the entire arch. This wire was divided in two, and a small jack screw fastened on one end, capable of revolving; the end of the other wire was screwed. When caught up by the jack screw it tightened the wire to any extent desired. Wooden wedges, placed judiciously against the lingual sides of the teeth, enabled me to rotate the teeth as desired.

With the models exhibited and the difficulties to be overcome, you will, I think, see the utility of the appliances employed, in which, I trust, some originality can be discriminated. In the model of the completed case, so far as the upper is concerned, I think you will see that satisfactory results have been secured. I have had this case in hand for about nine months, yet the patient still wears the retaining plate at night, as it is possible the teeth might recede, although I think it improbable. The occlusion is no better than when I took the case in hand, but it is at least no worse, and the defect lies now in the lower, which, I hope, in course of time to take in hand, and when completed to exhibit the results to you. I might, perhaps, add that this patient lives at a distance of 30 miles, and that after the first week I rarely saw her more than once a week, and often only once a fortnight.

The models of the next case I have the pleasure of bringing before you are somewhat similar, but even more complicated than the last. It came into my hands for treatment last October, and is evidently the outcome of heredity combined with lip or thumb-sucking. The patient is a female, aged 11, of good physique and a sanguine disposition. Her parents were much distressed at the deformity produced by the irregularity. It was with great reluctance I was persuaded to take the case in hand, and then, I might, perhaps, mention, as being a practical point, not without first clearly establishing our financial relations, which were arranged to be independent of the result of my efforts.

From the models you will note there is not one single tooth,

either in the upper or lower, that can be said to occupy a correct position—the two upper molars making the nearest approach to it. The occlusion is very defective, and the teeth honeycombed. The molars are also very defective, and in the lower jaw they and the bicuspsids are barely above the level of the gums. They all seem to have been hurried into position, regardless of their condition of maturity, and show all sorts of imperfection in the enamel. To crown all, the two central incisors were poor, immature looking things, with as before stated, defective enamel at their cutting edges and at the lingual aspect, and standing out so far that there was a space of five-eighths of an inch between them and the lower teeth. She had also fallen upon them, and the nerve in one of them was dead. A worse condition of affairs than this is hardly conceivable.

I first made a silver plate for the lowers, with a bar soldered round the front. To this bar was fastened a number of elastic rings to fit round the four front teeth, which brought them forward rapidly (that is in about three weeks time) the distance of a quarter of an inch. I had then to make a small retaining plate until they became firm in their sockets. Meantime, I extracted the two centrals in the upper and made a plate, with a somewhat novel device, by which the laterals were drawn into position to act as their substitutes. Before the introduction of this plate the laterals were three-quarters of an inch apart; they are now one quarter apart. The canines have also been drawn in a little. This case is not completed; she is merely wearing retaining plates, as there is a danger in using too great haste.

The main aim here is, as far as possible, to correct the projection in the upper and the recession in the lower, so as to restore the features and expression, as her teeth are so poor that they are unworthy of consideration, but with the prospect of being able to give her substitutes, which afterwards will make her more presentable and prove more useful. Her mother and aunt both exhibited the same unfortunate peculiarities—the former having, previous to marriage, been under my treatment in respect to them.

I have here the models of a very similar case which came into my hands some years ago, and which I showed at the West of Scotland Branch of the B.D.A. The uppers protruded beyond the lowers to an unsightly extent, so that when the back teeth were closed, the lower incisors did not meet the upper by a distance of five-eighths of an inch. The lady

was present at the meeting, and shown with and without the apparatus I am about to describe. The patient was young, but, unfortunately, too old to have the defect rectified by regulating devices. Yet she had such a fine face and expression that I deemed it desirable that something should be done for her. I therefore struck up a sort of glove for the lower teeth (in platinum), on which I mounted a set of six teeth, bringing them up to meet the uppers. They were finished with continuous gum work, and were a very considerable improvement to her. She does not wear them constantly, but reserves them for occasions, and kindly lent them for this meeting.

At our meeting of 1882, I brought before your notice a case of a child, about six months old, who fell and drove her two central incisors (upper) out of sight up into the alveolar process. The family physician (called in immediately) stated that, as they were knocked out, the mouth would soon heal up, but the swelling became alarming, and I was consulted about it. I operated under chloroform and removed them. Not having seen a case similar at so early an age, I was doubtful whether the permanent teeth would suffer in consequence. Thinking it might interest you, I have secured models of the mouth after a lapse of eight years, which I now place before you. The centrals are now in position, and are in no way impaired. They are inclined to be irregular, but will probably right themselves as the other teeth come into position. Any displacement shown could not, in any case, be said to be the result of the accident.

The next case is that of a female, aged 11, in which the six front teeth have taken abnormal positions. The labial aspect of the right lateral is behind the lingual surface of the right central, the said central standing out too far. The left central has its lingual surface turned towards the mesial side of the right central, and its distal edge is standing in behind the left lateral. The canines stand forward right in front of the laterals; that, at least, is the position they indicate, as the mere points of them are all that are yet showing. I have been rather unfortunate in this case, as, after having almost succeeded in correcting them, and when the patient was wearing a retaining plate, she had an attack of scarlet fever, during which the plate was removed, and unhappily the teeth again resumed, to a great extent, their former positions. You may see, from the models I hand round, the breadth gained this stage.

I also show a couple of cases that have just come to hand—one in which the upper left canine is crowded out of the arch, and all the other teeth in situation; the other where the two centrals are locked in behind the lower incisors, and which I have just begun to regulate, but possessing no particular points of interest; and with them I conclude my paper.

OBSERVATIONS ON THE STRUCTURE AND DEVELOPMENT OF OVARIAN TEETH.

By T. CHARTERS WHITE and J. BLAND SUTTON.

(Concluded from page 347).

ADDENDUM.

By MR. T. CHARTERS WHITE.

In 1863, Mr. Alfred Coleman read a very interesting paper before this Society on Cystic Tumours, in which he dealt very widely with the various tumours affecting the maxillary region particularly. In the course of this paper he reported on ovarian tumours and their contents, and where in the various hospital museums specimens could be seen. He then proceeded to speak of the forms of the ovarian teeth he had met with, and their histological characters, but had examined too few to enter to any great extent into this subject. A microscopical examination of some ovarian teeth, carried out in conjunction with Mr. J. Bland Sutton, may advance our knowledge of the form and histology of these abnormalities, certainly in the direction of confirming Mr. Coleman's careful observations, while the thoroughness of Mr. Bland Sutton's work will considerably add to our information relative to their nature. This contribution of mine can only be regarded in the light of a report added as a supplement to his paper, and as the result of a careful examination of hard sections with the view of ascertaining the nature of the various histological elements entering into the constitution of ovarian teeth. The most convenient order in which to report on these conditions is by commencing with their macroscopical features. The forms kindly supplied to me could be assigned to the molars and bicuspid, but were not of that form usually presented to us by normally developed teeth. The molars were stunted in their growth and

finished abruptly at their necks in some cases, while in others the roots extended as a single *tap* root brought suddenly to a close. The most striking feature about the molars was their well-pronounced and numerous cusps standing up like nipples on what we should in an ordinary tooth call the masticating surface—the cusps separated from each other by deep fissures. The bicuspid might in many specimens have been taken for malformed canines with the same form of root as that already described as appertaining to the molars. The apical foramina were in some cases quite absent, while in other specimens they were left widely open, even in some to the entire width of the neck of the tooth. The enamel presented a sodden appearance, and was not of that smooth character usually met with, and moreover was perforated with holes resembling those met with in a worm-eaten wood. So much then for the external appearance of these teeth. Some were then slit open with a diamond disc on the dental engine, no great difficulty even being presented by cutting them through with a wet piercing saw on account of the friability and want of cohesion in the enamel fibres. On inspecting such a section it was seen that the perforations, before noticed on the enamel, entered and traversed the enamel in tortuous tubes as if bored by some annelid. The granularity of the enamel which enabled the teeth to be sawn in two proved a barrier to grinding the sections to any great degree of thinness, but it was better to have a view of the enamel and its character in an imperfectly ground section than losing it altogether in vain attempts to grind it thin, for that would have ended in its suddenly disappearing into powder. By an examination of such hard sections as I was enabled to make, we shall be in a position to observe the three histological elements contained in ovarian teeth.

The enamel prisms presented every degree of granularity and were frequently marked with those cross striations usually found in imperfectly developed enamel, while the prisms themselves twisted and twirled about in every conceivable direction. The junction of the enamel with the dentine frequently presented a fringed appearance from the irregular prolongations of wide and distorted dentinal tubuli into its base. In one specimen a portion of the enamel was wanting, while the hiatus was filled up by true bone with its lacunæ and canaliculi; on the opposite side of the section the bone again occurs, but so gradually fused with the enamel fibres that it is difficult to tell where one ends and the other

begins. It is perhaps in the dentine we observe the most marked irregularity and the definite departure from the usually staid appearance of that tissue. The dentinal tubuli are there, but they seem to have followed no definite course for long, for suddenly they will curve off the course and become developed in a most turbulent appearance, frequently terminating in wide, irregularly-shaped cavities, or becoming looped in a prominent manner with some of their neighbours, or invading the enamel as before mentioned. The dentine in these teeth afford an abundant display of inter-globular spaces not exactly of the character usually seen in globular dentine, but smaller and more generally scattered throughout its substance, while large and irregularly-shaped lacunæ are frequently met with filled by sarcoous tissue which readily takes a stain, as may be seen in some of the specimens on the table. The cementum has been small in quantity in the specimens I have examined, and presented no features calling for notice.

In many teeth the extraordinary absence of a pulp cavity, and consequently of the dentine-forming organ, is a fact worth calling attention to. In the teeth I have been examining the cavity has been present, but in all cases but two the pulp was wanting, as the teeth were not recent, the two I allude to were recent, but the pulp very small and fragmentary, but I was enabled to partially harden and cut sections from them. The first thing brought under my notice very prominently was the large size of the vessels as compared with the delicate capillaries of a normal pulp—these were very large, with well-defined coats and decided branches. No nerve fibres were discerned in these specimens. The stroma throughout which they were distributed was coarser and more open than is found in general and properly developed teeth. Each of the smaller recent teeth for which I was indebted to Mr. Bland Sutton was enclosed in a close, tough, fibrous cyst, which had to be opened and removed, and the tooth shelled out. I did not notice anything peculiar in this structure worth mentioning. In bringing my brief and perhaps bald report to a close I can only sum up the results of the examination of these very interesting teeth by saying that in my opinion it would be a useless waste of time to enter into a lengthy description of irregularities of structure which are not constant, because, however accurately you may describe the histological irregularities of one tooth, the examination of the next may give you appearances of a

totally different irregularity, and thus it would be impossible to formulate any definite description of tissues so aberrant as those of ovarian teeth.

ANÆSTHETICS IN RELATION TO DENTAL SURGERY.

By Mr. OSBORN.

(Concluded from page 350).

Nitrous Oxide gas will do very well for minor operations, but we must call to our aid another anæsthetic, when we require to perform a more prolonged operation, and the two most commonly used are chloroform and ether. Of the two, ether is considered to be the safest by the majority of the medical world ; still, there is a large minority, who hold the opposite views, amongst the latter being Sir J. Lister.

From my own point of view, I side with the latter gentleman, and must say, that chloroform is, of the two, the best and most suitable for all dental operations. The action of chloroform on the heart is at first stimulating and afterwards depressant ; the latter action is really why so much has been said against it ; but then look at any table of statistics relating to death under chloroform ; the majority of cases show, that the person was not perfectly healthy in every way, and, what is more, the administrators in many cases could not be classed as skilled in the use of this drug. Now, this clearly shows that death, in many cases, was caused by mal-administration ; you cannot then place these deaths down as being due to the drug.

Chloroform should be given at first very largely diluted with air ; not more than 4 per cent. of chloroform should be allowed the patient, then gradually increase the per centage. Paul Bert clearly showed that 8 grammes of chloroform mixed with 100 litres of air will produce anæsthesia, unattended with any danger or inconveniences, and this may be maintained for a considerable period of time.

Then again, there is no doubt that shock, conveyed to the heart, through insufficient anæsthesia, is accountable for some deaths.

The main facts to be considered in administering chloro-

form are :—close attention to the pulse, the pupil of the eye, and most important, the breathing. The pupil first dilates, and then, as the patient succumbs to the anæsthetic, it contracts, anæsthesia being deepest when the pupil is most contracted. But opinions differ so very much. A Dr. Hughes wrote to the *Lancet* some years ago, and said, “If I were to be placed under chloroform, I would say, ‘Never mind my pulse, never mind my heart, leave my pupil to itself,—keep your deepest attention on my breathing, and if it becomes embarrassed to a grave extent, take an artery forcep and pull my tongue well out.’” Very good advice—advice which a clever London anæsthetist, the late Mr. Symes, followed, and from which he could say he never lost a single case from chloroform, although he had given it in 5000 cases.

It is most important that the chloroform should be pure. Chloroform distilled from rectified spirit is most pernicious. I have myself seen cases in which the same gentleman has been obliged to use the two kinds on two different patients, and the one was most successful and the other most unsatisfactory.

A good test is simply to allow a small quantity to evaporate off the hand or a piece of blotting paper, if a disagreeable odour remains you can be sure it is not pure.

To bear out my statements, I refer you to the latest scientific investigations. The Hyderabad commission on chloroform, which originated in the munificence and public spirit of the Nizam of Hyderabad, who spared no expense to have a thoroughly reliable report made by experienced men. I need not trouble you with a lot of statistical figures, but will give you the pith of the report. In the opinion of the commission, chloroform, properly administered with all due regard to pulse, pupil and respiration, is comparatively as safe as an anæsthetic can be; that there are dangers the commission does not deny, but they can be minimised by careful and skilful administration.

I will finally give you an account of experiments made by an American physician concerning the use of alcohol before the administration of chloroform. In 100 cases where alcohol was administered, five deaths occurred, whereas in 100 without the administration of alcohol, no deaths occurred. A little alcohol, after the recovery of the patient from the anæsthesia is often beneficial in cases where extreme prostration occurs.

Although chloroform was fast falling out of favour among our older practitioners, it was not so with our younger mem-

bers of the medical profession ; yet do not these facts, so well brought to light by the commission, fully prove it is a safe anæsthetic as long as skilfully given, but that, in common with all anæsthetics, it becomes dangerous, if the general precautions laid down are neglected. From these few facts, I am sure, we can say that chloroform is as good, and, I think most of you will say better, than ether for all prolonged dental operations.

I now pass to my last subject,—ether. This drug, in my opinion, is not at all suitable for dental operations : some of the principle faults to be found with it I will mention.

It has a very strong pungent odour, which is generally intensely disliked by most people, and it remains in the system a long time, causing after effects, such as coughing, vomiting, headache, dizziness, and general malaise.

A great objection, that is ether produces an excessive flow of saliva, it also considerably distends the arterials, causing often tiresome bleeding. This in major operations, is a good thing, causing notice to be taken of the most minute vessels, but in dental surgery it is very often only the cause of a great deal of trouble. Ether is administered, as you know, in quite a different way. We give chloroform freely diluted with air, ether is given pure, and no air allowed to enter the inhaler.

It is generally thought now that sulphuric ether is the best and purest ; impure ether, like impure chloroform, often causing dangerous complications.

Ether anæsthesia is often accompanied by marked muscular tremour ; this also proves a great drawback and a hindrance to the operating surgeon. I have seen cases where the patient had to be tied down, so as to prevent this tremour, and to allow the surgeon to operate.

Owing to the intense cold produced by ether, the smaller blood vessels of the lungs are caused to contract, and so offer such a degree of resistance to the right ventricle as to stop it if it be weak, or embarrass it, if strong.

There is great danger, too, in administering ether to people subject to bronchial affections, often causing acute bronchitis to follow ; and I know of a case of a young lady, who, there is no doubt, has ether to thank for chronic bronchitis, she never having had such a thing before its administration. These few facts are enough, I think, to prove the superiority of chloroform, and I have not the least doubt, but that chloroform will each year grow more and more into the confidence of medical men.

A. C. E.; N₂O.*

By H. E. HARLAN, D.D.S., Toledo, O.

THE subject of anæsthesia, whether local or general, must be of considerable interest to the members of a profession who are continuously called on to inflict pain and suffering. And as the tendency of the public is to avail itself of the relief offered by anæsthesia, we will certainly be called on more and more to serve the public in this respect.

I have nothing to say of the propriety of a dental surgeon administering an anæsthetic, as that is a matter to be discussed under another head. Neither do I wish to be classed with the gas and vitalized air tooth pulling fakir, but rather seek to bring the subject before you as one who is anxious to know more of anæsthesia and the best methods of obtaining it.

In presenting this paper to the society I am impelled more by the hope that it will bring out intelligent discussion and sharp criticism that will give new light and information on this subject, rather than of any desire to foist a theory on you or that I am offering anything new. That the subject is fraught with interest, both in its anæsthetic phenomena and its physiological effects and manifestations, no one will deny.

In the administering of gas and other anæsthetics, there are certain effects that are to be guarded against, and that are a cause of apprehension and fear when they occur, and this fact makes a timid, careful man desirous of such changes or additions as will best insure safety and freedom from danger to the patient and operator, and having had some experience with this combination anæsthetic, I have come to some conclusions based on data obtained in my own experience that I shall present to you in this paper.

It is an incontrovertible principle that any form of general anæsthesia is a condition of danger, and those who administer anæsthetics should seek to use only such agents as are the freest from the signs of danger, and that have the smallest death record from their use.

Every careful and honest dentist who has administered N₂O, will readily admit that there are certain phases and conditions of this anæsthetic phenomena that are both alarming and a cause for apprehension, and while the data before the profession as to the death rate makes it exceedingly small,

* Read before the North-western Ohio Dental Society, at Toledo, O.

yet deaths do occur, and the alarming symptoms still continue which are a cause of anxiety to the operator and alarming in the extreme to the patient's friends. These facts have compelled me to regard the possible modifying or changing of the physiological effects for the better as a thing to be desired and sought after, and has taught me that a thorough acquaintance and familiarity with the heart beat, arterial pulsation, respiratory effort, discolouration and appearance of patient, length of anæsthetic period, purity and quality of gas, are things of major importance, and that they can only be learned and retained by continual practice, and experiment; and in this spirit I was led to use the combination anæsthetic with which I have headed my paper, A. C. E.; N₂O.

To intelligently comprehend the nature of the combination one must understand the physiological effects of A, C and E singly and in combination with N₂O. Alcohol when taken into the stomach in small doses is a stimulant, cerebral excitant and anæsthetic, and raises the temperature when inhaled as a vapour. These effects are repeated, only intensified.

A very simple experiment is to hold the head over the high wine tub in a distillery, and inhale the alcoholic vapour for a few minutes. There is first a sense of exaltation, then a marked increase in the functional activity of the heart and lungs with a noticeable increase of temperature. After a few breaths of air the effect passes away. It may be said with certainty that alcohol in the gaseous or vapour form acts more readily and quickly than in the liquid, and that it increases the vital activity and energy, and hence its value in this combination.

In ether narcosis probably the most marked physiological change is the progressive paralysis of the vital functions, the respiratory centres becoming depressed more rapidly than the circulatory. And this in connection with any abnormalities of breathing after the muscular relaxation has set in should be especial signs of danger, as also are stertorous breathing, excessive lividity and great pallor of the face and the irregularity of the pulse.

In chloroform narcosis the signs of danger are to be looked for first with the circulatory system, though it has not been infrequent for both the respiratory and the circulatory centres to be affected simultaneously. Owing to the peculiar lethal power of chloroform and its liability to cause death in the first stage of administration, it is doubtful if it should be used in any but small quantities, and supported by positive cerebral stimulants.

In combining A.C.E. with N₂O, it should be remembered that alcohol is administered in a vapourized state, and in sufficient quantities to antidote the chloroform. (Note Dr. Snow's experiment.)

It is generally admitted that pallor, lividity, stertorous breathing, failure of heart, depression of respiratory centres, decrease of temperature and asphyxia, are the special signs of danger in A.C.E. and N₂O narcosis when administered singly or in combination.

Now, to avoid these several signs of danger, and to maintain a normal functional activity of heart and lungs is to progress, and when to this is added flushing of the face, increased temperature, profound anæsthesia, and freedom from stertorous breathing, it is certainly bringing anæsthesia to that point where danger is reduced to a minimum.

To obtain these results I use pure gas, A₂ C. E₃, about two drachms to ten or twelve gallons of N₂O, allowing the patient to have a full respiration of air every third breath.

The effect of this combination is peculiar, in as much as it is devoid of four noticeable features of ether, chloroform and gas, that is, pallor or lividity and decrease of temperature, circulation and respiration. Under its influence the pulse increases, the lung activity and energy is greatly exaggerated, and there is a decided flushing of the head and face with increased bodily temperature.

The admixture of air I consider an essential feature, although it takes longer to produce anæsthesia. The patient usually has decided and vivid dreams, which are affected to a considerable extent by surrounding objects and sounds. There is frequently a tendency to become lacrymose and the patient seems to be in that maudlin condition produced by alcohol.

The period or length of time that the patient remains insensible to pain varies in individuals and I find in very young persons that the admixture of air produces decided symptoms of hysteria. The patient generally recovers slowly and regularly to a normal condition, and, so far as I have been able to ascertain, has never been followed by any untoward symptoms.

I once had a patient vomit after she had began to recover from the effects of the combination, but she was two months pregnant and as she expressed it was continually sick at the stomach, and had recently eaten a hearty meal and had drank four cups of tea with it, so that I considered that the anæsthetic was hardly responsible for that effect.

Under the influence of this anæsthetic I have extracted twenty-two teeth and roots at one administration with no pain to the patient, and have frequently extracted ten, and a dozen, so that the first case could be no special exception.

There are cases, of course, where I do not use the chloroform in the combination, and I am not laying down any rule that will not have to be changed or varied, as the case will determine whether the anæsthetic should be used at all, and the intelligence of the dentist or operator will be called on in every case to use his best judgment and exercise the utmost care and caution.

I always have prepared and at hand nitrite of amyl, ammonia, and alcohol in a hypodermic syringe, a sponge filled with cold water, and always insist on the patient having the throat, chest and abdomen free to expand and unencumbered by braces, stays or bandages. The general directions for preparing a patient and their position I will not repeat, as that is known to all of you.

In keeping a record of the heart beat and pulse I always keep my forefinger of left hand on the external carotid artery on the left side of the neck, as it is more convenient than to keep it on the wrist.

In closing this paper I repeat that this is yet an experiment, but, as I believe, worthy of some consideration for the reasons mentioned.

ROBINSON'S FIBROUS AND TEXTILE METALLIC FILLING.

By W. BUZZELL, D.D.S., Port Clinton, O.

I HAVE no pecuniary interest in the manufacture of this useful article, and no acquaintance with the manufacturers ; if I had, I would endeavour to have it re-christened with a shorter and less inconvenient name.

I have used it, however, for the last six years to fill the cervical portion of cavities in the approximal surfaces of molars and bicuspid with most gratifying results. I have four such fillings in my own mouth, and a recent examination showed them to be in perfect condition after three to six years' use.

I have been able to examine several that I inserted four to six years ago, and found them all in good order.

My method of procedure is as follows: I prepare the cavity as I would for gold, making a groove or undercut entirely around, or as nearly so as practicable. Then I adjust a matrix (I generally use a matrix), and insert the foil in pieces a little longer and wider than will cover the floor of the cavity, first pushing the pieces into position by hand-pressure, with a moderately large faced plugger and condensing well with the mallet, being careful to pack it solid against the matrix and into the retaining groove, and especially into the angles formed by the matrix and the margin of the cavity. I fill one-third to one-half of the cavity with the Robinson foil, completing with cohesive gold and finishing as usual. As the foil will tarnish, it should not be used where it can be seen. It will not, however, discolour the tooth. It welds readily if annealed by warming on a hot steam pipe, moderately warm stove, or over an annealing lamp, taking care not to melt or burn it. Gold will adhere to it enough to make an easy start, which is readily accomplished by packing a small piece of gold into an angle with a small pointed plugger, and building across until the gold is securely held by the walls of the cavity. Anchorage for the gold should be secured independently of its adhesion to the Robinson foil. I think it has all the advantages of tin in such cases. On account of its softness and *spreading* qualities it can be rapidly inserted and perfectly adapted without injury to the margins of the cavity walls, an important consideration when filling teeth with frail walls or of inferior texture. In such cases I believe it to be more reliable than gold alone or amalgam.

The Ibo people in Africa kill the children who cut their upper teeth first, sparing only those whose lower teeth come normally.

MUMMIFIED CATS are getting scarce, and it is rumoured, that the Egyptian Government have prohibited any further exportation. Dentals who want to investigate their teeth must, therefore, make haste.

British Journal of Dental Science.

LONDON, MAY 1st, 1890.

STATE versus COLLEGE DIPLOMAS.

SEEING ourselves as others see us, is a phrase more suggestive, perhaps, of books of the "John Bull" type, than of a leader in a Dental Journal. And yet, when this is possible, it is not only interesting but instructive. Mr. L. D. Shepard, in a paper read before the First District Dental Society of the State of New York has given us British Dental Surgeons a glimpse of how our Hospital system is viewed by some of our American confrères. He says:—"In all their larger towns, the English have dental hospitals, supported by subscriptions, which are hospitals indeed as well as in name, while we have not one. These hospitals, when connected with dental schools, are as useful as our infirmaries for instruction and are true charities for the poor, while no one can claim that our college infirmaries truly deserve the designation of charities. Whatever we may think or say of our English brother, to him belongs the credit of adorning the dental profession with that grace which has been declared the greatest of the three—charity." Now, as far as this goes it is eminently satisfactory. We do not quote it, because it is more or less complimentary, it is because we may take these words as the opinion of an unbiassed observer, in which direction we must persevere to reach the goal we have all in view; the good of the Public and the welfare of our Profession. Moreover, the fact that whatever they may think or say of their English brother, the Americans nevertheless are slowly copying him in several alterations of their laws, is

greater proof of their sincerity than words alone would be. If any one should ask why all American dental diplomas are not recognised in this country, there would not be a better answer than a study of this paper of Mr. Shepard's. We are not prepared to argue out why the two, Michigan and Harvard were recognised, and the others were not, but when we read :—"In our country also it is generally a very easy matter to obtain a charter for a college. There is little or no inquiry into the object and still less into the responsibility, respectability, or standing of the corporators. In some States there is a general law under which a college can be chartered as easily as a church, a manufactory, or a yacht club. One city, I am told, has seven dental colleges of varied size, plan and respectability"—Then it can be understood why a selection is needed; and surely the burden of proof of fitness must rest with the Colleges. Massachusetts and Mississippi have now laws requiring all persons to be examined, by the State whether they possess a diploma or not, so as "to secure the people against the consequences of ignorance and incapacity, as well as deception and fraud." But what, we may ask, is the use of the Colleges granting a diploma at all, if it bears no right to practise? It can scarcely be looked upon as an honour, if it be as Mr. Shepard (himself an examiner for the State,) seems to think, that in many cases its bearer is quite unfit to, in future, be granted a licence by the Board. We thoroughly agree with Mr. Shepard, that "the great end in view, *when granting a charter to a College*, is not the issue of a certificate that the student is competent, but the educating him so that he shall be competent." It seems to us, that if he would shield "the fair name and fame" of an American Dental Diploma, Brother Jonathan must level up the curriculum and examination standard required for his diplomas, must dissociate the teaching from the examining body, and prevent the word College or Hospital being abused by its application to an institution run by unscrupulous men as a mere money-making machine.

THE ACTION OF PERCHLORIDE OF MERCURY ON DIFFERENT METALS—The *Glasgow Medical Journal* publishes an article on this subject. It seems, that some few years ago, the drains of a Training Home for Nurses were found very much out of order, although but recently overhauled. The plumbers suggested the solution of bi-chloride of mercury, which had recently come largely into use, had something to do with the matter. Mr. Ernest Mayland, B.S., undertook a series of experiments to test this opinion. He used such metals as are employed for waste pipes,—cast iron, copper, lead, brass and solder. A one per cent. solution was used, changed once every week for a year. The results of these experiments justified the following conclusions :—Lead pipes, especially the line of junction and the solder, underwent rapid surface erosion, losing about 4 per cent. of their weight in the year. Brass lost the same amount, on grasping it, it broke into brittle fragments. Iron lost from 20 to 30 per cent. ; Copper about 18 per cent. Brass, iron, and copper were not eroded on the surface, but were thinned. A knowledge of the behaviour of different metals under the action of various re-agents, &c., is most important in our speciality. What we want, is someone to collect and classify experiments such as those just detailed.

A curious “effect” was related a few weeks back in *The Hospital*, as following an injection of cocaine. A professor had it injected in his jaw, and immediately became unconscious ; artificial respiration was resorted to, and after six hours consciousness returned. During those six hours—while he was apparently lifeless—he heard all that was going on round him. Ever since the incident, the unfortunate savant has been haunted by the remembrance of a case of drowning, where he tried artificial respiration for two hours and then gave in. What if his doctors had given in at the end of two hours ?

We are glad to see that a “Storekeeper” has been ap-

pointed at the Leicester Square hospital, who will in future relieve the House-Surgeon of the wearisome work of giving out gold, &c. This may to outsiders seem a small matter, but, after all, life is made up of small matters, and certainly this will not only prevent the waste of the students' time by delays in obtaining materials, but also greatly increase the value of holding the House-Surgeony. He will now be able to devote his whole time to the patients, and so will acquire much greater experience.

While on the subject of this Hospital, we may notice that the Calendar for 1890—91, has just been issued. The list of past students gradually increases in length, but one cannot help being struck by the want of uniformity in the abbreviations adopted in the "honours" list appended to each name. Dental Surgery is shortened in no less than seven ways.

1. Dental. Surg. and Path.
2. Dent. Surgery and Pathol.
3. Dent. Surgery and Path.
4. Dent. Surg. and Pathology.
5. Dent. Surg. and Pathol.
6. Dent. Surg. and Path.
7. Dent. Surg.

Other names are shortened in an equally varied manner. Surely a more uniform system would be better. A useful addition would be a short paragraph stating for what the prizes were given. True, one can find out what the "Saunders Scholarship" and the "Ash's Prize" are, but both the "Buchanan" and the "Dean's Prize" have ceased to exist, and to the last generation of students imply little more than a name.

DR. E. ABBE has presented the Royal Microscopical Society with a new apochromatic one-tenth objective, made by Zeiss, under his direction. Fluorite is used, instead of crown glass, in one or more lenses, hence there is a higher

degree of achromatism. But its special feature is, that the angular aperture is the highest yet obtained, being 30 per cent. greater than anything previously made by Zeiss.

ENGLISH Surgery has just received a signal honour, at the hands of the governing body of the great school of medicine and surgery now being built in Rome. The subject of the bas-relief over the principal elevation of the surgical department is to be, Sir Joseph Lister demonstrating his system of dressing wounds. Over the Medical department will be one representing Morgagni teaching his pupils.

“In all creation there has been no production equal to this human temple—pyramid and statue are without colour, without voice ; nor can they think. This is beautiful to look at, wonderful to talk to, an ideal construction. From whence or whither are not germane questions on this occasion. A million, nay ten billion lives may have contributed to this grand result, or it may have been erected in obedience to a whisper from divine lips. From turret to foundation infinite wisdom is displayed, and in no particular more so than in that section of the temple you have elected to serve. Thirty-two sentinels should stand at the portal of life, of even stature and in uniform of pearly white, ornamental by design and of supreme importance.”

This is a paragraph from a speech at a Dental Prize-giving. Fortunately, at last, the speaker dropped “metaphor” and talked common sense, else it would have taken the greater part of the said student’s future life to make out what it all meant. One wonders whether anyone remained to listen when the common sense came, or whether, like certain members of our parliament, the speaker had “talked the House out.”

Manipulative Miscellany.

All new instruments or articles wished to be described under this heading are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

Mr. George Cooksey, L.D.S., sends us a sample of a Modelling Material used by him for base-plates, much as hard-bake is used. It has the advantage of this, in toughness and in ease of manipulation. On the other hand, it does not seem to us to be capable of being so easily adapted to the inequalities of the model. This is, perhaps, hardly an objection if the case be baked on the model. Apparently it consists of a thick paper soaked in some white fatty body. We note there is a "Provisional patent"!

Abstracts of British & Foreign Journals.

PHARMACEUTICAL JOURNAL.

PEROXIDE OF HYDROGEN.

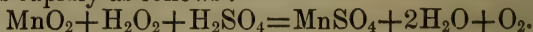
By D. B. DOTT.

Peroxide of hydrogen, or hydrogen dioxide, was discovered in 1818 by Thénard, who prepared it by the action of dilute hydrochloric acid on barium peroxide. This is the method still generally employed, though the process is varied by the employment of other mineral acids, as sulphuric, phosphoric, and carbonic acids. Although the reaction is theoretically the same, it does not appear that the yield of dioxide is equally good whatsoever acid is used. Hydrogen peroxide is likewise formed in the oxidation of a multitude of organic compounds

in presence of water. It was first observed by Schönbein, that peroxide of hydrogen results from the oxidation of essential oils in presence of moisture, and within recent years a practical process for the preparation of the peroxide, by the oxidation of turpentine, has been worked out by Kingzett. The precise reaction which occurs is not certainly known, but is believed by Kingzett to be approximately as follows :— The terpene is first oxidized to a body $C_{10}H_{16}O_3$, which by the action of water forms soluble camphor and hydrogen dioxide :

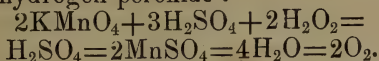


Hydrogen dioxide is a typical peroxide readily parting with one of its oxygen atoms, and is therefore a valuable oxidizing and bleaching agent, yet at present its employment is somewhat limited by two circumstances, firstly its rather considerable cost, and secondly its proneness to decomposition. It is only as these barriers are gradually overcome that the peroxide can have a wide application in chemical industry. It is not practicable to prepare a very strong solution directly ; recourse must be had to evaporation in vacuo. When that is done, it is found, that the aqueous solution gradually decomposes, the more rapidly the stronger the solution. Decomposition is more rapid in an alkaline than in an acid solution, and the presence of certain metallic oxides greatly increases the rate of decomposition. Ether and alcohol are among the best preservatives, though not always admissible ; and, as recently brought under notice by Kingzett, some of the metallic salts considerably retard decomposition. Like some other oxidizing agents, peroxide of hydrogen is a good disinfectant and antiseptic, and it has been introduced into medicine both as a local application and as an internal remedy. There are other instances, such as nitrous acid, where an oxidizing compound acts also as a reducing agent, but in none is this property so strikingly exemplified as in the case of hydrogen dioxide. When manganese dioxide is added to the solution, oxygen is slowly evolved, and on the addition of an acid the reaction proceeds rapidly as follows :—



that is, each molecule of manganese dioxide gives up an atom of oxygen along with that from the molecule of hydrogen peroxide with which it reacts ; so that, when the reaction is used as means of estimating the peroxide, we have only to measure the evolved oxygen, and calculate O_2 as equivalent

to H_2O_2 . Similarly, potassium permanganate in acid solution is reduced by hydrogen peroxide :



This reaction may be employed for determining the amount of peroxide present, either by measuring the oxygen evolved, or by noting the amount of standard permanganate decolorized. The reaction likewise proceeds in an alkaline solution. Mr. A. H. Allen recommends the use of the nitrometer as a convenient means of measuring the amount of oxygen given off on mixing hydrogen dioxide and permanganate, and it is doubtless a useful method.

DENTAL COSMOS.

ACTION OF PEROXIDE OF HYDROGEN UPON THE TEETH.

By DR. W. H. MILLER.

AFTER referring to Mr. W. H. Rollins' experiments, published in the *British Journal of Dental Science*, which showed that after a time a tooth placed in Peroxide of Hydrogen became so soft that it could be bent between the fingers, Dr. Miller states, that he believes this decalcifying action to have been due to an acid solution being used. There are two preparations, the medicinal and the technical ; the latter has usually a strong acid reaction, one he examined contained 0.3 per cent. of hydrochloric acid. An acid preparation should not be used in the mouth, it should be neutralized and filtered before using upon teeth out of the mouth, In a lecture on the peroxide of hydrogen delivered by Busch before the Odontological Society of Germany, he showed three glass vessels, the first contained a number of sound teeth, the second a cross-section of an elephant's tusk, the third a section of a walrus tooth, all in 10 per cent. solutions of the technical peroxide of hydrogen. The reaction was neutral or but slightly acid. The bottom of all the vessels was covered with a fine white powder, while the liquid was clouded by a precipitate of a more flocculent nature. An examination of the teeth which had been lying, in the solution for six weeks, showed that the enamel had not been very seriously affected ; it had lost its polish, and

on drying was found at some points to have become superficially opaque and chalky. The action upon the roots was much more pronounced. They were softened to a depth of about one-half millimeter (at the apices still more), and could be readily cut with a knife. The softening was not, however, of the nature of a decalcification; the roots were not cartilaginous, as when softened by acids, but rather chalky, cutting very much like soapstone, suggesting the thought that the organic constituents, which hold together the lime-salts, have been destroyed. The powder covering the bottom of the vessel was readily soluble in acids with a slight residue, and was found to consist of 14.7 per cent. organic matter and 85.3 per cent. inorganic matter (lime-salts). The flocculent precipitate above mentioned consisted of gluten which had been dissolved and was subsequently precipitated by the gradual change in the reaction of the solution. The effect upon the section of ivory which had laid for six months in the solution was very remarkable. On attempting to remove it from the vessel it fell into "a thousand pieces," very much like a piece of charred paper. Small pieces of it placed in solutions of various acids, mineral and vegetable, were speedily dissolved leaving a very delicate, fragile, and transparent residuum. The other pieces, on being dried, were rubbed up into a powder with the greatest ease. The analysis gave 10.65 per cent. organic matter, instead of 38 per cent., which I found in normal ivory. The solvent action of the peroxide of hydrogen upon the basis-substance of dentine may be further illustrated by the following experiment: A cross-section of the tooth of a whale (*Catodon*) after being decalcified was brought into 10.0 ccm. of a 10 per cent. solution of technical peroxide. In twenty days the greater part of the section had been dissolved; the solution gave a dense precipitate on addition of a drop of tannic acid. The result seems to leave no room for doubt that neutral or nearly neutral solutions of peroxide of hydrogen act upon dentine by destroying or dissolving the organic matter, by which, the lime-salts are liberated or their bond of union destroyed. At all events, the agent in question should be used with some caution, and when applied repeatedly, or when used as a mouth-wash, as suggested by Busch, the necks of the teeth should be particularly watched and the use discontinued in case the disintegration begins to show itself. These observations have a certain interest from another point of view, inasmuch as they show us what we should have to expect in case decay of the teeth resulted

from a destruction of the organic matter by bacteria, thus permitting the lime-salts to fall apart, as was formerly maintained by some authors. If such were the case, the decaying dentine would be reduced to a chalky, friable mass, which might be readily pulverized in a mortar, and not to the tough cartilaginous mass which we actually find.

A RAPID METHOD OF MAKING A GOLD PLATE.

DR. MICHAELS in half an hour made a gold plate of four teeth, the time for the setting of the plaster not being counted. He uses a special gold plate, which is very thin and pliable; it can be worked like sheet-lead. The sheet-gold is smooth on one side, roughened on the other. Obtain a good impression with gutta-percha. In this impression run a mixture of two parts plaster to one of sand, and obtain a model about an inch in height. Then adjust on this model the teeth as well as the clasps; when a clasp is well adjusted, tighten it somewhat, and push it with force into its proper position, so that it cannot be displaced. When the clasps are in place take a piece of sheet lead and cut it according to the shape wanted, mark the upper surface, place on the gold plate described above, and cut a piece out according to the pattern. Then take this piece of gold and place it in position, the smooth side of the plate in contact with the plaster, while the roughened or quadrilated surface looks upward; adjust this with a good burnisher. To retain this plate in position drive little nails about half an inch in length by the side of it into the plaster, and with a pair of pincers turn the ends so that they press on the plaster surface and render the plate immovable. The teeth are then placed again on the model and plate, and retained in position with hard wax. Then invest the teeth and model in a plaster and sand mixture, while the wax is washed off with boiling water; of course, the whole upper quadrilated or roughened surface must be left exposed, as it is by running solder all over this plate that the desired thickness is obtained. When the plaster is dried, all the spaces that may be left between the plate and backings as teeth or clasps are filled with small scraps of platinum foil made into pellets and pushed into position. After the whole surface and backings have been well covered with borax, the piece is ready for soldering.

ARCHIVES OF DENTISTRY.

CANCER OF THE TONGUE.

DURING the period extending from 1875 to 1888 ninety-one cases of carcinoma of the tongue were operated on at Prof. Volkmann's clinic. Of these, two died immediately after operation, these being cases of complete extirpation, of which there were thirty-five in all. The average duration of life following the operation in these last-named cases was twelve months; one was absolutely free from recurrence six years after. Of the fifty-six cases of partial extirpations, seven were found to be free from recurrence after the same lapse of time. The most rapid recurrence in this class took place in eight months. The microscopic diagnosis was established in all cases. Prof. Volkmann, after trial of the submental method of operating, abandoned it. He likewise rejects preliminary ligature of the linguals, as well as preliminary tracheotomy. In the relatively easy cases the tongue is brought well forward and hemorrhage is arrested in the wound; in more difficult cases Langenbeck's method of temporary section of the lower jaw, with division of the palatoglossal arch, is adopted; a drainage-tube is placed in the recess of the tonsil. Cases involving the epiglottis are rejected.

Dr. E. M. Todd, in the *Dental Record* gives the following as a local anæsthetic, which he has tried and found very efficient:

R Cocaine Mur. gr. 50.
 Acid Boracic, gr. ii.
 Liq. Hyd. Bichlor, M. 40.
 Aquae Destal ad. M. 250.

M. To be applied locally by means of pledgets of cotton, held tightly to the gum on each side of the tooth to be extracted.

A series of excerpts, compiled by T. G. L. for *The Dental Advertiser*, giving the practice and opinions of a number of excellent and well-known operators in the matter of root-filling, viewed as an election return, stood as follows: Oxychloride of zinc, 7; chloro-percha and gutta-percha points, 6;

chloro-percha solution, 5 ; chloro-percha cotton, 1 ; chloro-percha, lead and tin, 1 ; oxychloride of zinc and wood, 1 ; oxychloride of zinc and gold, 1 ; lead, 4 ; gold, 2 ; tin, 1 ; amalgam, 1 ; spunk, camphor and carbolic acid, 1 ; carbolized cosmoline on cotton, 1 ; saudarac varnish on cotton, 1.

INOCULATION OF SYPHILIS BY DENTAL INSTRUMENTS.

The editor of the *Dental Review* makes the following very pertinent remarks :—The question of using the utmost care in cleansing instruments, and immersing them in antiseptic solutions forces itself upon us in all cases, whether it be suspected by the operator that his patient is a syphilitic or not. Dentists are daily using forceps, scalers, excavators, probes, lancets, burs, drills, elevators, clamps, and last but not least, the rubber-dam in the mouths of patients. If these be not cleansed and disinfected, what certainty is there that an innocent person will not be inoculated with this dreaded constitutional disease ? We have earnestly advocated, for years past, the sterilization of instruments, *all instruments* used in contact with the skin or mucous membrane, or in the roots of teeth, or the so-called pyorrhœa pockets. Any dentist can be provided with the means of disinfection so easily that there will be no cause for fear of future trouble.

R	Resorcin -	-	-	-	-	-	gr. x
	Water -	-	-	-	-	-	minims xc

or,

R	Bichloride of mercury	-	-	-	-	gr. iiij
	Hydrogen di-oxide	-	-	-	-	$\frac{3}{4}$ v
	Water -	-	-	-	-	$\frac{3}{4}$ vi

or,

R	Beta-Napthol	-	-	-	-	gr. xl
	Water -	-	-	-	-	$\frac{3}{4}$ xv

or if carbolic acid is desired as an ingredient of a disinfecting solution :

R	Carbolic acid	-	-	-	-	gr. lvvii
	Resorcin -	-	-	-	-	gr. xxxiii
	Water -	-	-	-	-	$\frac{3}{4}$ xii

This may be further diluted three times with water, and it will still be effective. *Be sure to cleanse and disinfect our instruments to-day.*

From a Speech of Dr. BUTLER, Master of Trin. Col. Cam.

on

THE FUNCTIONS OF A MEDICAL SCHOOL.

“Think of what is meant by a great medical school, or rather let me say, of just a little of what is meant. It means that a band of our ablest men, the flower of their profession, are acting in concert with the definite ambition of exploring and fathoming the secrets of human suffering, and straining every nerve to relieve it. These men form a brotherhood ; each knows that he can rely on his comrade. They contribute each his well-known stock of skill, and stimulate each other’s enterprise. Further than this, these leaders are not alone ; they have under them a staff and students—a staff of skilled officers competent at any moment to step into a post of chief command, and students of various ages, some of them among the picked men of our University, all proud to belong to a famous school, all animated by a strong corporate feeling, all eager to learn from what they see and hear. And what sights do they not see in that silent hospital ! They see sufferers from almost every kind of disease ; they see the treatment prescribed and carried out by the elders whom they trust. In grave cases of surgery they see the most delicate and difficult operations performed before their eyes by the masters of their profession.”

MOUTH-WASHES.

Monte, in the *Deutsche med. Wochenschrift*, gives the two following formulas for prophylactic mouth washes :

R	Acidi borici - - -	gr. xxxviiij
	Aquæ destillatæ - -	f $\frac{3}{4}$ viij
	Tincturæ Myrrhæ - -	mxxxxviiiij

M

R	Sodii salicyl - - -	gr. xxxxiij
	Aquæ destillatæ - -	f $\frac{3}{4}$ viij
	Tincturæ Myrrhæ - -	mxxxxviiij

M

Sig. Wash out the mouth several times daily with either of the above formulæ.

A LEECH IN THE LARYNX.

Prof. F. Massei, in an interesting article on foreign bodies in the air passages, in the *Archiv. di Laryngolog.*, reported, among other noteworthy cases, that of a man who had suffered since a fortnight with profuse hæmopteses. He came home exceedingly weak, and dated the beginning of his trouble from his swallowing some water from the water casks of a vessel upon which he was sailing. At the laryngological examination a leech was found, attached to the right ary-epiglottidean ligament. It was at once removed, and the symptoms relieved.—*Intern. Journ. of Surgery*,

STATE OF TEETH IN PREHISTORIC SKELETONS.

JOHN WARD writing to the *Pharmaceutical Journal* says :— I noticed in your review of G. Murray Humphry's 'Old Age,' an explanation for "the remarkable preservation of the teeth" in the "skeletons of our forefathers." It was to the effect that their owners were more frequently "cut off in their prime by battle or disease" than is now the rule. This may be quite true. But recently I conducted some excavations on the site of a long barrow in this county (these ancient burial places are generally held to be not less than 3000 years old), in the course of which some seventeen or eighteen skeletons, many of them much disturbed and their bones scattered, were exhumed. These bones related to individuals of all ages, from youth upwards, several having been considerably advanced in life. Of 152 teeth (free or attached to the bone) that were found, only five or six showed any signs of caries, and of these two were doubtful. Yet many of these teeth were so much worn that in life they must have been brought down to almost the level of the gums, presenting beautiful sections, in which the dentine seems almost as hard as the enamel.

ETCHING LIQUID FOR STEEL is made by mixing one ounce sulphate of copper, one quarter ounce of alum, and half teaspoonful of salt reduced to powder, with one gill of vinegar and twenty drops of nitric acid. This liquid may be used either for eating deeply into the metal, or for imparting a beautiful frosted appearance to the service, according to the time it is allowed to act.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

DISCUSSION.

Mr. Arthur Underwood said, that he rose with very great diffidence because he would honestly confess that he came with a very open mind, but still he thought it would be unfair to so able and carefully-prepared a paper to allow it to pass without at least some kind of attempted comment. In the first place it would be generally recognised, that Mr. Bland Sutton and Mr. Charters White had thrown a great deal of fresh light upon their subject, and he was of opinion that their paper would form a classic upon the subject. He was not aware that any literature they had now dealt at all fully with the questions taken up in the paper. Recently he came upon a case published in a Boston journal; it was a careful description of teeth lodged in two bones which resemble the parietal bones separated from each other by a suture. The teeth were called simply molars and bicuspid, but they did not seem to Mr. Underwood to be anything of this plain description. He would be happy to give Mr. Bland Sutton the reference to the case if he desired. His next point was in connection with Mr. Sutton's remark that he did not believe there was any recorded instance of ovarian teeth with more than one fang. Although it was a dangerous thing to suggest that Mr. Sutton was possibly in error, but it seemed to Mr. Underwood that the specimen No. 994 which Mr. Sutton had passed round had two fangs at the top; possibly if the bone were chipped away it might prove not to be so. Another point was with reference to epithelial pearls: possibly Mr. Bland Sutton was not aware of some interesting researches from the pen of a Frenchman who discussed these formations at great length and endeavoured to prove that at times they were abnormal teeth and at other times they were tumours. With regard to the disorder of the tissues: it was obviously present, and he thought such disorder was always present in an abortive attempt to form a tooth. It was present when the pulp forgets to do its natural work and endeavours to form secondary dentine. When there were secondary teeth they were always of a disordered kind. Of course Mr. Bland Sutton was careful to cut the particular section illus-

trated through the centre of the tooth, though it looked from the drawing as if it might be a little off the pulp. He would be glad if Mr. Sutton would put them in the way of obtaining such specimens as were exhibited. He (Mr. Underwood) would for his part promise to cut them, examine them, and report upon them. In conclusion, he thought the Society would be able to do greater justice to the paper later on.

Mr. Charters White, as the author of the section referred to, replied that he was careful to cut it as near the median line as possible with a diamond disc and a dental engine. He must say, that he very much regretted that he was unable to get more than two sections out of one tooth, therefore he cut each tooth into two sections and he ground them down pretty flat and polished so that he thought that they had obtained one side of the median line. Transverse sections had not at present been obtained, but he hoped to get them when more specimens were procurable.

Mr. Storer Bennett thought the Society was to be congratulated upon the extremely able paper to which they had listened; and as this was the first occasion that Mr. Bland Sutton had been out after a severe illness, they would take it as a very great compliment that he had come down to deliver the paper himself. Mr. Bennett was exceedingly interested in hearing Mr. Sutton's remarks as to enamel being deficient on the crowns of teeth, reminding them of the fissures that were to be seen in molars and bicuspid. Mr. Sutton said that at the bottom of these fissures there was fibrous tissue. Now on the authority of Charles Tomes it was known that these fissures were often filled by Nasmyth's membrane, and it was very remarkable, as Mr. Sutton had pointed out, that cementum was either not present or was exceedingly thin, and that instead of cementum or Nasmyth's membrane there should be in the case of ovarian teeth fibrous tissue.

Mr. George Cunningham (Cambridge) simply rose for the purpose of asking a question, viz., whether any caries had been found in the teeth in these cysts. His reason for asking the question was, that at Buda Pesth he saw a cyst of the same nature containing carious teeth. His impression from noticing Mr. Bland Sutton's specimen was that caries was present in the various kinds of teeth.

Mr. Charters White remarked a casual observer might very often mistake some of the foramina for caries. They were brown and corroded, no polish at all on the surface, and they seem to be eaten into by holes, more like worm holes than anything else, but with perfectly defined borders.

Mr. W. A. Maggs asked for information as to the condition of the multilocular cysts and the formation of multicuspidate teeth since they seemed altogether exceptional.

Mr. F. J. Bennett said that Mr. Sutton's paper induced speculation in the absence of any apparent rational cause for certain departures from the usual course. With reference to calcification Mr Sutton had stated, and Mr Charters White had also given it the weight of his authority, that there was no pulp cavity in some of the teeth from which the sections were taken. If they looked at the nodules of secondary calcification found occupying the pulp cavity of old teeth, the formation seemed to begin from a central spot and to increase by layers deposited one upon another from within outwards, or centrifugally. Might not these teeth, so eccentric in many ways, develop in a somewhat similar manner, and precisely in an opposite direction to that of normal primary dentine, which calcified from without inwards? It would seem probable some unusual agreement existed, as Mr. Sutton had said that in many of the teeth there was no cementum, or only in a very rudimentary form indeed. Mr. Bennett remarked that in Sir Richard Owen's "Odontography," published many years ago, there was a description and a fine litho of an ovarian tooth.

Mr. Bland Sutton replying, said he was extremely indebted to Mr. Arthur Underwood, and should be glad to be favoured with the references to the papers he mentioned. He might say, as to the tooth having a bifid fang, that upon looking at it again, he thought Mr. Underwood was probably right. He (Mr. Sutton) had examined many hundreds of these teeth for bifurcated roots without finding them, that at last, he supposed, he must have got careless; but it was a point that he would take the earliest opportunity of putting beyond dispute. Should Mr. Underwood's view be correct, it would only modify the paper to the extent of stating that bifurcated roots were "of the greatest rarity" instead of that "they were unknown." Now with reference to caries, although he had intentionally excluded the subject in delivering the paper, it had in reality been included in the paper which had been prepared by Mr. Charters White and himself. Caries in ovarian teeth had not been demonstrated. These ravines in teeth always contained fibrous tissue. Caries in ovarian dermoids, in the sense employed for buccal teeth, had yet to be demonstrated. With reference to Mr. F. J. Bennett's remarks, it was a curious thing that both Coleman and Salter had

noticed, that dentine radiates from the line rather than the pulp chamber. However, it showed the value of bringing a question of that sort before a Society instead of writing the subject up in one's study, and packing it off to a journal. In threshing a subject out before a Society, many valuable suggestions were often made in the course of discussion. With reference to Mr. Magg's question, he would say that any number of teeth over twenty or fifty in the cysts was most rare. The dermoid before them was most exceptional. There was nothing peculiar about the teeth, but it would not be wise to draw any conclusion from them. In conclusion, he wished to say that the discussion had been a most profitable one to him.

The President said it afforded him a great deal of pleasure to offer the thanks of the Society to Mr. Bland Sutton and Mr. Charters White for their most interesting, able, and suggestive paper. They were all greatly rejoiced to see Mr. Sutton restored to health again, for had the illness been fatal it would have been a loss not only to their Society, but to the whole scientific world. The next meeting would be on the 14th of April, when they would have a contribution from Mr. Henry Sewill on "Some Points in the Etiology and Pathology of Dental Caries," illustrated by photo-micrographs of the tissues shown upon a screen by Mr. Andrew Pringle. There would also be a casual communication from Mr. Scott Thomson on "Splicing Engine Cards."

The meeting then separated.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

The Annual General Meeting of Session 1889-90 was held on March 21st, at the Rooms of the Society, 5, Lauriston Lane, Edinburgh—Mr. John A. Biggs, L.D.S., Glas. President, in the Chair.

Mr. J. Keith Chisholm, 15, Duke Street, Edinburgh, was balloted for, and duly admitted a member of the Society.

Mr. W. E. Satchell, L.D.S., Elizabeth Street, Hyde Park, Sydney, N.S.W., was, on the recommendation of the Council, nominated for membership.

The Treasurer (Mr. Mackintosh) handed in his report, which showed an income for the year, amounting to £41 18s. 2d. derived from subscriptions, entry money, and interest on

bank account. This, with a balance of £8 1s. 5½d. from the previous year, and a deposit-receipt of £105, gave a sum total of £154 19s. 7½d. After deducting expenses, including rent of rooms, printing, &c., &c., a balance of £130 3s. 1d. was left as representing the entire funds of the Society.

Mr. Macleod proposed the re-election of the office-bearers for the ensuing year :—

President, Mr. John A. Biggs ; *Vice-Presidents* Mr. J. Moore Lipscomb, Mr. G. W. Watson ; *Treasurer*, Mr. James Mackintosh ; *Curator and Librarian*, Mr. J. Stewart Durward ; *Secretary*, Mr. John S. Amooore ; *Councillors*, Messrs. Campbell, Price, Dr. Williamson, and Mr. J. Graham Munro.

Mr. Macgregor seconded the motion, which was adopted without dissent.

In accordance with the notice given at the December meeting, Mr. Macleod proposed the following alteration of the existing Laws :—

“The Law, as it at present stands, reads thus :—

“The Society shall consist of Ordinary, Honorary, and Corresponding Members.

“The Ordinary Members shall consist of Gentlemen practising as Dentists in Great Britain, and of Medical or Surgical Practitioners interested in Dental Surgery.

“The Honorary and Corresponding Members shall consist of Gentlemen practising Dentistry in Great Britain, in the Colonies, or in Foreign countries, and of retired Dental Practitioners in Britain, as well as such Medical or generally Scientific Men as may have distinguished themselves in connection with Dental Surgery.

“The Ordinary Members shall have vested in them the government of the Society, and all cases not otherwise specified shall be decided by them, by a majority of votes, by ballot, if required.

Mr. Macleod moved that it shall in future read :—

“II. Ordinary, Honorary, and Corresponding Members.

“The Society shall consist of Ordinary, Honorary, and Corresponding Members.

“a. Ordinary Members.—Gentlemen shall be eligible for Ordinary Membership who hold the Licentiate in Dental Surgery of any of the Licensing Bodies of Great Britain or Ireland, or a Colonial or Foreign qualification recognised by the General Medical Council, entitling them to practise Dentistry in Great Britain.

“b. Honorary Members.—Gentlemen [practising or retired]

who hold a qualification recognised by the General Medical Council, or Foreign or Colonial Dentists holding a qualification recognised in their own country, who may have distinguished themselves in the practice of, or in connection with Dentistry, and Medical or Scientific Men who may have distinguished themselves in connection with Dentistry shall be eligible as Honorary Members.

“c. Corresponding Members.—Gentlemen resident in the Colonies or Foreign Countries, holding qualifications recognised in their respective countries, shall be eligible as Corresponding Members.

“The Ordinary Members shall have vested in them the government of the Society, and all cases not otherwise specified shall be decided by them, by a majority of votes, by ballot, if required.”

Mr. Durward seconded the motion.

Mr. Wilson proposed a counter motion, to the effect that the law should remain as it at present stands ; in which he was supported by Mr. Brownlie.

Some considerable discussion followed, in which Dr. Smith suggested that it would be well to adopt Mr. Macleod's motion, but that it should not come into force till two years from the present date, which would give ample time for any not possessing the licentiate ship or its equivalent to join if they wished to do so.

Dr. Williamson spoke in favour of Mr. Macleod's notion, as amended by Dr. Smith.


Mr. Macleod said that Dr. Smith's suggestion in no way impaired his proposition, it being merely a question of the date at which it should come into force ; and he would therefore have pleasure in adopting it, and asking the President to put it to the meeting in that form.

The motion and counter motion were then successively put to the meeting, when the former was carried by a majority.

THE EFFECTS OF BAGPIPE PLAYING ON THE TEETH.

Mr. MACLEOD said :—Recently one of the bandsmen of the Cameron Highlanders was having some teeth filled at the Dental Hospital. On overlooking the work being done, he observed a peculiarity in the teeth of the young man under treatment, and, on inquiry, found that the young man was a piper and that the peculiarity noticed was caused by the mouth-piece of the pipe. Mr. Murray Thomson, the student under whose

care the lad was, took two most excellent impressions, and he had now the pleasure of passing round the models obtained from these impressions, which would give a graphic idea of the peculiarity noted—viz., three crescentic-shaped apertures between the cutting edges of the six front teeth.

He had examined the teeth of various pipers since then, and all of them presented the same “wearing away” in a greater or lesser degree, varying with the density of the tooth structure and the time engaged in pipe-playing. He found on inquiry that, on the average, it took about four years to make a well-marked impression, but that, once the enamel edge was worn through, the “wearing away” was more rapid. Every one was aware of the way in which the tobacco-pipe wore the teeth of the smoker, but this was not to be wondered at, the baked pipeclay being a hardish and gritty substance; but that a horn mouth-piece should have such an appreciable effect was, he thought, a matter of curious interest. He might mention, however, that the mouth-pieces suffered more than the teeth—the average life of a horn mouth-piece being from twelve to eighteen months, that of a bone or ivory one (a substance seldom used) being about two years. The peculiarity noticed was a crescent-shaped aperture  on the cutting edge of the front teeth in three localities—viz., between the central incisors, and between the lateral and canine on both sides.

DR. SMITH thought the case referred to by Mr. Macleod one which had never previously, so far as he knew, been noticed or described in any dental treatise or association. The different situations in which the wearing down of the teeth occurred, and which corresponded with the positions to which the mouth-piece was shifted while playing, showed that this was obviously the cause of the injury. The fact of a bone or horn mouth-piece producing this effect seemed more remarkable than the well-known similar consequences resulting from using a clay tobacco-pipe. But although the bone or horn was a much softer material, its action was possibly aided by the much harder bite capable of being sustained by it than could be borne by a clay pipe stem.

MR. LESLIE FRASER (Inverness) spoke of a case he came across in his practice. The patient was about twenty-five years of age, and had been playing the bagpipes for over seven years. The two central incisors were very much cut or worn towards the mesial line. They were also so very loose that he picked them out quite easily with a napkin be-

tween his forefinger and thumb. This patient always held the "chanter" between his two front teeth, and having rather a swinging gait, this probably caused a good deal of vibration between the mouth-piece and the teeth when he walked. The patient also suffered from Rigg's disease, more particularly in connection with the teeth in question. A plate of black rubber was inserted, and he finds he is able to grasp the mouth-piece quite as well now as formerly. How long these porcelain teeth will survive the strain is quite another question.

Artificial Restorations of Jaws.

Mr. DURWARD exhibited a patient who had had the right half of the superior maxilla removed, along with a sarcoma. He had supplied the deficiency with a vulcanite denture, which restored the contour of the face, and also supplied the necessary masticating power—and invited the members to inspect the result. Of the improvement effected and the comfort imparted to the patient there could be but one opinion; and, in reply to a remark made by a member that such an arrangement could be but temporary, as there was always the liability of the growth to recur, Mr. Durward said that it was in any way an advantage to the patient that the remaining years of her life should be made as tolerable or comfortable as circumstances or rather art could permit.

Mr. MACLEOD showed models and described a case of artificial restoration of a large portion of the lower jaw. The loss of substance extended from the cuspid on the right to the second molar on the left. The loss was occasioned by the discharge of an army rifle beneath the chin.

Aluminium Plates.

Mr. MACLEOD exhibited an upper denture aluminium cast base, which had been worn with satisfaction and comfort. He also exhibited the Carrol Company's furnace flask, and pneumatic crucible for working the material. He referred to the use of aluminium plates between twenty-five and thirty years ago—the drawback attending its use, and preventing its general adoption at that time, and explained that as many of these had been now removed, it might be worth while to place aluminium once more upon its trial, and determine its value as a dental base.

Dr. SMITH said he was somewhat interested in Mr. Macleod's communication on aluminium as a base for artificial dentures. He had himself about thirty years ago brought its use before

the dental profession in Edinburgh, and had the honour of receiving the silver medal of the Royal Scottish Society of Arts for his mode of employing this substance in these cases. Mr. Macleod's method, in the very admirable piece of work handed round, was somewhat different from that adopted by Dr. Smith, inasmuch as Mr. Macleod's was a process of casting the metal so as to take the place, as it were, of the vulcanite in an ordinary vulcanite denture, whereas Dr. Smith's method consisted in striking a plate of aluminum and mounting the teeth upon it by means of vulcanite attached to the plate by a number of countersunk perforations. This obviated the necessity of contact with any other metal; as aluminium was peculiarly sensitive in this respect—the difficulty of soldering it or allowing any other metal to come in contact with it, such as even the platinum pins of the teeth, being, that it corroded at the points of contact. Dr. Smith had exhibited to many of the dentists of the time sets made in this way, as well as some plates for the smaller lesions of the palate. One of these sets was worn by a well-known and respected old member of the profession for many years and was very little changed in the end. Its appearance was against the use of this metal, as it had a dull and leaden look about it. It was, however, very light and very cheap, and in most, though not in all cases, when properly handled, was fairly durable in the mouth. Purity of the metal was in all cases essential, and this he had found sometimes difficult to secure.

Mr. BROWNLIE had had no great personal experience with aluminium, as he did not look upon it as a metal that would ever be of much service to them, for reasons already quoted by Dr. Smith. A dentist in Glasgow—one of the advertising fraternity—had at one time taken up the matter rather warmly, and had gone the length of taking out a patent in the matter; but as he (Mr. Brownlie) had heard nothing of it of recent years from that source, he concluded that the dentist in question had discovered its defects, and abandoned its use.

Mr. WATSON mentioned that he had some experience in the making of aluminium plates while with his old master, Dr. Orphoot. They were made on the same principle as that described by Dr. Smith, but were found, especially when not kept clean, to corrode very rapidly, only lasting for a year or eighteen months.

Mr. BIGGS said that he had some considerable experience under Dr. Smith some twenty-eight years ago, and had assisted the doctor in constructing some of the plates for which

he had received the medal of the Society of Arts. He could corroborate what Mr. Brownlie had said, that many years after this a patent had been taken out for this very same process by a Glasgow dentist, who made a very great number of cases, but, latterly, even he had abandoned its use. It was interesting to see the apparatus and the cast denture in aluminium, but he could not say they had an attractive appearance. A set of teeth in gold would have a vastly higher apparent intrinsic value, and patients were not likely to appreciate a case approaching so much in general appearance to that of Britannia metal. He thanked Mr. Macleod for bringing the case before the Society.

Bacilli.

Mr. WATSON handed round for inspection cultures of Miller's spirillum and Finkler's spirillum (or comma bacillus), and pointed out that the appearance of the two organisms under cultivation are exactly alike, and, by means of photo-micrographs, showed that the microscopic appearances of both are analogous, although the one is found in the mouth and the other in the intestinal canal of cholera patients. They both grow very rapidly in culture media, and are undoubtedly distinct organisms.

Mr. J. A. BIGGS then read his Paper on "Treatment of Irregularities of the Teeth, illustrated from cases in practice." [See page 385.]

In the discussion which followed :—

Mr. BROWNLIE considered that much thought and discretion should be exercised before commencing regulating cases, as he had seen so much injury done to the teeth in the way of predisposing them to caries, resulting from the necessary pressure brought to bear upon them in pushing them into the required positions, and from the lengthened contact with the regulating frame. This he had had brought before him in a recent case, where, before treatment, the teeth were absolutely free from caries, but subsequently several had required to be stopped, and which he attributed to the result of the regulating process.

Mr. DALL suggested that a retaining-plate was liable to do injury to the teeth, as it had often to be worn for a considerable period. He had frequently adopted the plan of making what he might term a retaining-cage of gold wire, which consisted of two somewhat thick lengths of wire, the one fitted to the labial and the other to the lingual sides of the teeth, the two being connected by thin pieces of wire passed between

the intervals of the teeth where possible, and also over them, where the bite permitted, in such a position as to secure them in the positions in which they had been pushed by the regulating frame, and, where desirable, sometimes passing thin pieces of flat gold between the front teeth and soldering them to the main strand. In this way, he was of the opinion that greater cleanliness could be ensured and less consequent injury to the teeth.

Mr. WATSON thanked Mr. Biggs for his interesting paper on irregularities, and expressed his admiration of some of the ingenious plates, &c., which Mr. Biggs had used in the treatment of cases. He was in the habit of discouraging, as much as possible, such cases, owing to the fact that they seldom paid for the time and trouble expended on them. Such cases required great discrimination and thought before attempting anything, and often proved extremely troublesome, while the results attained were not always very satisfactory. Mr. Brownlie's remark, that often great harm is done in the treatment of irregularities, was, he thought a very true one, as there is not the slightest doubt that more harm than good is frequently done in interfering with the mal-arrangement of teeth, especially in congenital cases, besides the impress that may be produced on the teeth themselves while under treatment, in giving them a greater tendency to caries.

Mr. BIGGS said that he forgot who was the originator of the method Mr. Dall described (Dr. Guelfard's), but it was an easy matter to show the fallacy of Mr. Dall's deductions. In the first place, in answer to a remark by Mr. Watson, he stated, that although it could not be removed for cleansing purposes by the patient, yet the wires were thin, and the brush could get between it and the teeth, and so remove any *debris*. Mr. Biggs said that in his opinion the smallness of the wire was an element of weakness, as any friction, even though slight, had a greater tendency to cut the teeth; and if the bristles of the brush were capable of getting between it and the teeth, it could not possibly be of any use in retaining the regulated teeth. Moreover, Mr. Dall spoke of having a piece of flat plate running between the centrals to steady the plate or cage, but he was of opinion that more injury would be done by such a contrivance in the course of three months than by such an arrangement as he had shown and described in three years. The teeth at that age being delicate and immature, it was necessary that as much facility for removing and cleansing, as possible, be provided, especially as retaining-

plates had often to be kept in use for a whole year. Mr. Biggs thanked the various speakers for the kindly criticisms they had passed upon his paper, and was gratified that so many had concurred in his method of treatment. Several of the plates, they said, were novel, and he could assure them they were original.

The President announced that the next meeting would be Thursday, the 13th November, and wished to all a pleasant summer ; and trusted they would come up next session stored with fresh and interesting facts and observations gathered during the long interval.

STUDENTS' SOCIETY OF THE NATIONAL DENTAL HOSPITAL.

ORDINARY MEETING held on Wednesday, April 2nd, at 8 p.m. P. W. Greetham, Esq., President, in the Chair.

The minutes of the previous meeting were read and confirmed.

Miss Brierley was elected a member of the Society.

Casual Communications.--Mr. E. G. Carter showed a case of erosion in the right upper canine.

Mr. Allnutt mentioned a case of hæmorrhage following extraction of a first left upper bicuspid. The bleeding ceased within half an hour after the removal of the tooth, coming on again profusely five days afterwards.

Mr. Spokes mentioned the case of a family all of whom had teeth of a dark brown colour ; this peculiarity was also demonstrated in the teeth of the grand-parents and great-grand-parents.

The gentleman who was to have read a paper, at the last moment being prevented from doing so, the meeting adjourned until the second Friday in May, when William Hill, Esq., M.D., B.Sc., Lond., will read a paper, the subject of which will be duly announced.

DENTAL ASSOCIATION OF VICTORIA.

MEETING of the Council held on 16th January, 1890, at the Athenæum, Melbourne.

Present—Mr. John Iliffe (in the chair), Dr. Carter, Messrs.

Kernot, M'Gregor, Stevens, and Thompson, L.D.S., also the secretary (Mr. Joske, LL.B.)

Apologies for non-attendance were received from the absent members.

The minutes of the previous meeting were read and confirmed.

The secretary read a *precis* he had prepared of the preliminary movements leading to the formation of the Association to be published with the articles of Association. This was unanimously adopted.

On the motion of Mr. Thomson, L.D.S., seconded by Dr. Carter, it was unanimously resolved—"That dentists using letters or additions to their names implying the possession of a diploma granted by some recognised and authorized body shall not be eligible for election as members of this Association."

Mr. E. Thorby Nookes, of Mortlake, was elected a member.

Mr. Thomson drew the attention of the Council to the fact that a duty had recently been imposed on dental instruments.

The chairman (Mr. Iliffe) and the secretary undertook to interview the Collector of Customs on the subject, with a view of having the duty remitted.

Mr. George Thomson nominated Mr. Peter Crank, L.D.S. England, and D.M.D. Harvard, as a member; also, Mr. James Fletcher, Carlton; Mr. Ernest Fits Hewlett, Fitzroy; and Mr. Hedley Ham, Ballarat, as associates.

Mr. M'Gregor nominated Mr. W. Boxall as a member.

Financial business concluded the meeting.

A general meeting of the members of the Dental Association was held on the same evening to receive formal notice of the incorporation of the Association to comply with the articles and memorandum. Mr. George Thompson, L.D.S., occupied the chair and made the necessary announcement.

Dental News.

The Nizam of Hyderabad has founded three annual scholarships, value £300 per annum, tenable in England for four years. The subjects for study are, medicine, law, physical science or engineering. The services of the students to be at the disposal of the Government for four years after their return to Hyderabad.

The *British Medical Journal* says :—" We are happy to learn that Sir Richard Owen's condition continues to improve, he now joins the family circle, and is able to spend the greater part of each day in his library."

The *Glasgow Evening News* states, that the Police Commissioners of Kirkintilloch have just been offered, and have accepted £1000 from a gentleman. The interest of the money is to be equally divided. One half is to meet the expense in connection with courses of lectures on all except political and sectarian subjects, and the other is to be applied so that the residents may have their teeth extracted free, gratis, and for nothing. If, however, the community of Kirkintilloch refuse to take advantage of leemosynary tooth-drawing, the deed of gift arranges that the money for this purpose may be applied to the relief of human suffering in some other way, and it further provides that, should the popular lectures, from some cause, become unnecessary, the money can be used in the direction of a free library—two very sensible alternative suggestions.

The Annual Dinner of the Athletic Club of the Dental Hospital of London will be held on Saturday, May 31st, at the Holborn Restaurant (Venetian Saloon). Mr. J. Smith Turner in the chair. Early notice of attendance is requested by the Hon. Secs., Messrs. E. Preedy and H. A. Forsyth, at the Hospital.

It is said, that Dr. Knorr, the discoverer and patentee of Antipyrine, cleared more than £200,000 during the late epidemic of influenza.

On Tuesday, the 22nd of April, at the residence of Mr. C. V. Cotterell, a presentation took place of a massive Silver Inkstand, bearing the following inscription :—" Presented to Felix Weiss, Esq., as a token of esteem and regard by past and present pupils, on his being elected President of the Odontological Society, 1890."

LEGAL.

ACTION AGAINST A LIVERPOOL DENTIST.

At Crewe County Court, before his Honour Judge Hughes, Q.C. The plaintiff, Charles Edwards, farmer, of Nantwich, sought to recover £20 from Albert Maurice, dentist, of Liverpool, for the detention of a set of teeth.

The plaintiff's evidence was that several years ago he bought a set of teeth for £15. The teeth were plated with gold, and encased in vulcanite. A few months ago he went to the defendant, and requested him to make some alterations in the upper case, so as to make the teeth more comfortable. The alterations were made, and afterwards, at plaintiff's suggestion, the lower set was repaired. Subsequently, while sitting in the defendant's room, the plaintiff suddenly jumped up and demanded an explanation, stating that he had not received back his right set of teeth; that, while his teeth were set in a gold plate, and cost £15, the set produced were largely vulcanite, and there was not a pound's worth of gold on the case. There was a scene in the defendant's surgery, and because the plaintiff declined to leave, the defendant walked out. The plaintiff's wife and daughter described the original set of teeth, with the gold plate.

The defendant said that the gold on the old case had been placed on the new, and while he could not swear it was the same piece of gold, he believed it was.

A young man named Rigby, who modelled the case, said it was the same piece of gold, and that none of it had been taken away.

The Judge said that the action suggested a serious accusation against the defendant, for which there was no ground. He gave judgment for the defendant, with costs.

APPOINTMENTS.

H. Lloyd Williams, M.R.C.S., L.D.S., appointed Dental Surgeon to the West London Hospital.

H. E. Harris, L.D.S.R.C.S., appointed Dental Surgeon to the West End Hospital for Diseases of the Nervous System.

Frederick Todd, M.R.C.S., L.D.S. Eng., has been appointed Dental Surgeon to King Edward's School, St. George's Road, Lambeth.

John Henry McColl, L.D.S., has been appointed Honorary Surgeon-Dentist to the Leicester Infirmary, vice Mr. William Tibbits, resigned.

THE BERLIN INTERNATIONAL MEDICAL CONGRESS.

HOW TO GET THERE.

The most convenient routes are *via* Queenborough and Flushing, by which Berlin is reached under twenty-four hours.

	1st Class, single.		1st Class, return.		2nd Class, single.		2nd Class, return.
At a cost of	£5 2 11 ..		£7 14 6 ..		£3 14 11 ..		£5 12 4
Dover and Calais	5 19 6 ..		9 14 0 ..		4 8 0 ..		7 6 0
Ostend	5 8 0 ..		8 13 3 ..		3 19 6 ..		2 6 9

Via Dover and Calais takes 33½ hours.

For those who like a longer sea voyage and shorter rail, Berlin may be reached *via* Southampton and Bremen or Hamburg in one of the Great North American liners. From Hamburg to Berlin is five hours' railway journey, and to Hamburg *via* Southampton about twenty-four hours.

The Hamburg American Packet Company has agreed to reduce, for the members of the Medical Congress, the saloon fare from Southampton to Hamburg to £2 5s. for single tickets and £4 for return tickets, available for fifty days, but not after November 1st. The rates include all meals on board the steamers. The steamers call at Southampton on their way from New York to Hamburg, generally on Thursday. The steamship *Augusta Victoria*, 8000 tons and 12,500 horse power, will probably leave Southampton for Hamburg on Thursday, July 31st. For information apply to Smith, Sundius & Co., 158, Leadenhall Street, E.C., and 22, Cockspur Street, S.W.

An attempt will probably be made to induce the Minister of Railways to grant some reduction of fares on the Prussian lines to foreign practitioners wishing to attend the Congress.

It is expected that the Emperor will receive the members of the Congress at Friedrichskron. A special feature will be the presentation of literary *souvenirs*. One will be the new edition of Professor Virchow's *Cellularpathologie*. Others will be a history of the development of medical societies in Germany, presented by the German Medical Association, and an account of all the institutions established in Prussia for the cultivation of medical science presented by Dr. von Gossler. The City of Berlin will also contribute a *Festschrift* of a corresponding kind.

Hospital Reports.

MONTHLY STATEMENT of operations during March 1890.

	London	National.
Patients	—	2864
Extractions	1410	976
„ under Anæsthetics	776	601
Gold Fillings	444	102
Other Fillings	1689	684
Irregularities	102	195
Miscellaneous	333	516
Artificial Crowns	38	—
Total	4792	3084
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">House Surgeons</div> <div style="border-left: 1px solid black; padding-left: 10px;"> <div style="display: flex; flex-direction: column; gap: 5px;"> <div>T. A. GOARD,</div> <div>VERNON KNOWLES,</div> <div>J. A. MALLET.</div> </div> </div> </div> <div style="text-align: right;"> <div style="display: flex; flex-direction: column; gap: 5px;"> <div>WM. FISK,</div> <div>A. PRAGER.</div> </div> </div> </div>		

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the British Journal of Dental Science.

Dear Sir,—In publishing the paper on “Preparation of the Mouth for Artificial Teeth,” in your Journal, I forgot to mention the courtesy I received from my colleague, Mr. Adams Parker, who kindly afforded me every help he could.

Yours sincerely,

T. H. GOFFE, L.D.S.

BOOKS AND JOURNALS RECEIVED.

Lancet, British Medical, Ohio Journal of Dental Science, Archives of Dentistry, Dental Cosmos, L'Art Dentaire, Le Progres Dentaire, British Journal of the Dental Association, Medical Bulletin, Chemist and Druggist, Pharmaceutical Journal, Dental Advertiser, Zahntechnische Reform, Journal fur Zahnheilkunde, L'Odontologie, Montreal Medical Journal. Items of Interest, Southern Dental Journal, Dental Review, Deutsche Monaschrift, Glasgow Medical Journal, The Dental Luminary, Dental Register, Odontological Transactions, Journal of Pharmacy, La Medecine Hypodermique, Dental Record, Western Dental Journal,

British Journal of Dental Science.

No. 536. LONDON, MAY 15, 1890. VOL. XXXIII.

A BRIEF ACCOUNT OF DENTAL LEGISLATION IN FRANCE.

It may not, perhaps, be without interest to our readers, if we give them a short historical retrospect of the various laws, which have regulated the practice of Dentistry in France during years gone by, and also a brief statement of the position of affairs at the present time ; with a resumé of the various proposals now before the French public, with a view to future legislation. We have at home so recently passed through a similar crisis,—a transition from a time of absolutely no control whatever, to one in which a long and expensive period of varied and scientific study necessarily closes the portals of our Profession to the unqualified and often incompetent free lance, we say, this is so fresh in our memories, that the present struggles of our Gallic friends must be peculiarly interesting to us all.

So long ago as the year 1614, we find Dentists mentioned upon the French statute-book, but there was no very formal reference to them till an Edict of 1768 laid down certain rules as to the period of study which would, after that date, be required, and as to the examinations which would have to be passed, before any one would be allowed to practise Dentistry. Article 126 of this Law, linking Dentists with the manufacturers of trusses, enacted that both should possess a certificate of fitness from the College of Surgery, whilst the succeeding articles gave the conditions under which this certificate was to be granted.

First, a pupilage with a qualified practitioner, for two consecutive years in Paris, or for three in the provinces, was required of the candidate, registration being strictly enforced. At the conclusion of this pupilage there was to be an examination of two days duration before various medical officials. On the first day, the questions were to be on the theory of Dental Surgery ; the second day being devoted to a practical examination. If the candidate acquitted himself to the satis-

faction of his examiners, and had presented a certificate of baptism, of religion and so forth, he was duly admitted; of course not omitting to pay the omnipresent fees. Then there followed a special clause, forbidding these Dental licentiates, to practice any branch of surgery, under a penalty of three hundred francs, or to assume the title of Surgeon under a penalty of one hundred. This almost seems a distinction without a difference, at any rate it is difficult to see so great a difference in the magnitude of the offences, as to justify the relative proportion of the fines, being in the ratio of three to one.

In the year 1789, however, the Revolution broke out, and all Laws regulating the practice of Dentistry, shared the fate of a great many other things, (including the lives of not a few people), existing at that period, i.e., they came to an abrupt termination. In May, 1791, (the year the King and Queen were arrested), a decree was issued abolishing all Corporations; this, of course, put a very effectual end to the attempt to exercise a judicial control over Dental study and practice. The People were "emancipated," they were to be henceforth supreme, and not unnaturally demanded a period of absolute liberty. Then, tyranny of the King, or rather of "la haute noblesse," was for a time followed, as all the world knows, by tyranny of the People. Everyone was free, and therefore, anyone who would, could practise what he would to the advantage or otherwise, of everyone else.

As years rolled on, and things again became more settled, the abuses which had grown up in Dental practice, during this period of absolute liberty, called for some restraining influence at the hands of the Law. It seems to have been the opinion of many, who doubtless held Surgical qualifications, that this could be best exercised by looking upon Dentistry as a special branch of Medicine, and so seeking to bring it under the Medical Acts, which then existed. In 1826, five years after the death of Bonaparte, the Bourbons being now upon the throne, a celebrated test case was before the Courts. Marie Delpenel, a Dentist's widow, who seems to have continued to carry on her husband's business, was prosecuted for illegally practising the healing art. The case was taken through several Courts, the prosecution arguing she was really practising a branch of Medicine, the defence that Dentistry was no such thing. Ultimately, the case was brought before the Procureur de Roi, and was by him dismissed. He delivered a long judgment, the gist of which

was, that Dentistry was neither a branch of Medicine nor of Surgery,—that it did not, therefore, come under the Medical Acts, and so Madame Delpenel, who confined herself exclusively to the Dental practice, was not guilty.

Nineteen years later, in 1845, another test case was brought before the Courts. Several men were prosecuted, the arguments turning on the same points as in Madame Delpenel's case, i.e., whether or no Dentists came within the law Ventôse, the Medical Act above alluded to. As is usual the Courts differed. The lower ones held that Dentists did come within the Act, they held that whenever in the said law Doctors or Surgeons or Officers of Health were stated, these were not to be regarded as mere abstract expressions, but by implication it included all who practised the whole or any one portion of the healing art. That a Dentist was a Doctor-Dentist, a Surgeon-Dentist, in the same way that an Oculist was a Doctor-Oculist, or a Surgeon-Oculist.

William Rogers, one of the defendants in this trial, carried the case from court to court, until at last the Court of Cassation, the supreme Court, acquitted Rogers, reversing the decisions of the lower Courts.

This case seems to have been regarded as establishing a precedent, for though other specialisms have since been held to come within the law Ventôse, Dental Surgery has never since been so looked upon by the law authorities.

In 1847, M. De. Salvandy presented a bill to "La Chambre des Députés," which proposed to bring Dentistry within the provisions of this Act, but in the following year the second Revolution broke out, Louis Philippe fled to England, consequently the bill came to naught.

But the question was not allowed to lapse, though during the second Empire no advance was made. Ten years since, however, the founding of the two rival Dental Societies, "La Chambre Syndicale de l'art Dentaire," and of "La Circle des Dentists," again brought the subject prominently to the front. Both these Societies are equally in earnest to ensure the progress, and promote the interest of Dentistry, but the views they hold as to the best means of doing so, are widely different. The former think that a state regulation is the essential point, whereas the latter consider that the establishment of a Dental School, is the important step. The former demand the prohibition from Dental practice of all who do not possess a special diploma, or are graduates of medicine; the latter would leave the present absolute liberty

of practice untouched, but would seek to remove the stigma of inferiority from French Dentists by simply giving facilities for studying and by maintaining a higher standard of teaching in the Schools.

The Government, being appealed to, granted a Commission to go into the whole subject, with a view to dealing with the question in the next Medical Law.

Without entering into all the details of the proceedings of this Commission, or entering into full particulars of the three schemes, viz., that of M. Lockroy, of M. Chevandier, and of M. David, while they are still sub-judice, we may yet take the liberty of reproducing a translation of the succinct account, which was given in tabular form in the "*Revue Odontologique*."

COMPARISON OF DIVERSE LEGAL PROPOSALS.

M. LOCKROY.

That the practice of Dentistry shall be prohibited to every one, not possessing the Diploma of Doctor of Medicine, or of Health Officer, under the clauses 1 or 2 of the present law.

But that, Dentists over 30 years of age, who can prove that they have been in practice for two years, prior to the passing of this Act, shall have permission accorded them to continue so to practise.

This permission does not give these latter, the right to administer anæsthetics.

M. CHEVANDIER.

That no person may practise Dentistry, nor take the title of Dr. of Medicine, nor of Surgeon, nor of Dentist, unless he possesses the right under articles 1 and 2 of the present law, or by virtue of a special diploma.

That this regulation shall cease to apply when a course of Dental study shall have been established and been in existence for two years in all the Faculties of Medicine of the State Schools, in Schools of Pharmacy and Medicine ; from the day when each of these schools shall have an examining board authorised to grant the diploma of Dental Surgeon.

French and foreign dentists actually practising their art shall be compelled within three months of the passing of this law, to sign a declaration that they are then practising Dentistry.

M. DAVID.

That the practice of the Dental profession in France or its Colonies be prohibited to all who do not possess the diploma of Doctor of Medicine, granted under the stipulated condition of Article 1, of the present law, or who have not the Diploma of Dentist granted by the French government, after examination before a Faculty, or a State Medical School, and after a course of study prescribed by the chief council of public instruction. That the right of practising Dentistry shall be granted to any Frenchman of more than 30 years of age, on the production of his patent of having practised two full years in France, or its Colonies, previous to the passing of the present law. A certificate instead of a diploma will be granted to them by the Faculties or Schools of Medicine. But in no case will a dentist have the right of administering anæsthetics without the assistance of a Doctor of Medicine, nor shall he have the right to prescribe medicines except in those cases stipulated by decrees granted on the advice of the Academy of Medicine.

TWO CASES OF PERIOSTITIS OF THE UPPER JAW, IN CLOSE RELATIONSHIP TO INFLUENZA.

By Dr. H. MOSER, of Hamburg.

THE more unusual complications, if closely related with influenza, appear quite as worthy of record and of quite as much interest as the mass of symptoms which accompanied the epidemic and which tend to show that it was more of a general infectious disease of the whole body. The two following cases of periostitis of the upper jaw, which I am about to describe, belong to the more unusual variety. The periosteal complication appeared on the fourth and fifth days after the first symptoms of the influenza.

In one case, that of a lady whose husband had been down with influenza for several days, the disease commenced with high fever without any shivering, with great feeling of weakness in the limbs, irritable cough and sneezing. Numerous small moist rales could be heard over the whole of the chest ; no dulness could be found. On the third day, violent pains set in in the left half of the chest, more especially in the left posterior and inferior region ; pleuritic dulness rapidly spread towards the front and upper portions of the chest, while the

catarrhal lung symptoms rapidly decreased. During the next few days the fever reached a very high point. On the fifth day, after a sudden attack of shivering, the patient complained of pain in all the teeth of the upper jaw ; the alveolar portion appeared considerably swollen, and painful to the slightest touch. The mucous membrane of the hard palate was also considerably swollen, but not very red, and just behind the front teeth a rounded swelling appeared, which increased in size till the following day, when it reached the size of half a hazel nut ; fluctuation could now be easily detected in it ; pressure on the nasal process also gave rise to considerable pain, especially on the right side, whereas no pain was complained of in the nasal bone. On the third day, after the shivering fit, the whole of the right half of the face over the upper maxilla, appeared considerably swollen, the left only slightly so ; the swelling on the hard palate had increased, the semi-globular eminence showed distinct signs of fluctuation, but the colour of the whole of the mucous membrane of the palate was nearly normal. An incision in the tumour gave issue to a very large quantity of thick sweet pus, and the flow was increased by pressing on the face from the root of the nose towards the teeth ; also by pressure on the palate behind the tumour. On the following day, I was able to feel the bone by probing through the wound. The swelling of the face went down rapidly after the abscess was opened, but the issue of pus continued uninterruptedly for another fortnight. In the left pleura posteriorly and inferiorly and in the left axillary line, friction sounds can even now, be detected that is, four weeks since the beginning of the influenza. It is only right to say that the patient had several decayed teeth, mostly on the right side of the upper jaw, but during the whole of the affection they were not painful, and no pus came from between the alveolus and the teeth.

In the second case, the patient, aged 25, was a merchant who had always enjoyed very good health. The influenza set in on the 23rd December with the usual symptoms. On the 26th, he complained of pain in the teeth of the upper jaw on the right side, no defect being noticeable in any of them ; the pain was felt as far forwards as the middle line, especially in the hard palate, and spread on the 27th in exactly similar a way to the first case, over the whole of the right nasal process. Here also the whole of the face was very much swollen, and the slightest pressure over the palate and nasal

process caused intense pain. On the 27th, in the evening, the right mastoid process began to be painful, the skin covering it commenced to swell, and the swelling stretched in an upward direction as far as the osseous border of the outer ear. The patient felt no pain in the ear itself, and the hearing was not affected. During the night of the 28th, the pain in the upper jaw, especially in the mastoid process, was of so severe and thumping a character, and was accompanied with so high degree of fever, that it prevented the patient getting any sleep. During the afternoon on the 28th, a large quantity of thick creamy pus suddenly burst from out of the outer ear, the swelling of the skin and the beating in the mastoid process meanwhile rapidly disappearing.

On examining the ear it was found that the pus came from an opening in the posterior wall of the external meatus, pressure on the back of the ear causing an immediate increase in the flow.

After careful syringing the membrana tympani was found to be intact, neither reddened nor pushed forward, and no disturbance in the hearing could be detected. The swelling and tenderness of the upper jaw also decreased in a marvellous way with the flow of pus from the ear, none, however, coming from the jaw.

The suppuration from the ear was very considerable till the 30th December, but from that date onward it decreased very rapidly.

During the evening of the 31st December, the patient was suddenly seized with a violent fit of shivering, followed by a feeling of intense heat, and he found that his hearing was completely lost on that side.

Intense congestion and slight protrusion of the membrane were now found, but no laceration. The hearing was not recovered till about three weeks, after repeated syringing of the outer ear, and catheterisation of the Eustachian tube.

REMARKS :—In both cases, therefore, the patients who had previously enjoyed the very best of health, were seized without any apparent cause in a most sudden manner, with slight but rapidly increasing pain in the teeth, which finally extended to the whole of the upper jaw; and in the second case, added to this was the affection of the mastoid process. In both cases there was considerable swelling of the mucous membrane of the palate, resembling œdema, and without any inflammatory redness, recurring fever, shivering; and in the first case there was an abscess of the palate, with partial

exposure of the bone. I still believe that this also existed in the second case, though to a smaller degree than in the first. The profuse suppuration from the outer ear, together with the previous swelling of the skin covering the mastoid process, coupled with the intense tenderness on pressure, I look upon as signs of periostitis, which was followed by inflammation of the middle ear.

So many complications and sequelæ of influenza have been noticed latterly, that it seems most probable that these two cases, which were in close connection and relationship with influenza, were really caused by the influenza poison. In fluenza may be looked upon, I believe, as an infectious disease, in the same way as measles, scarlet fever, and small pox, which may be followed by almost exactly similar symptoms to those I have just described.

CARIES AND NECROSIS—A CASE IN PRACTICE.

By J. E. MORTON, D.D.S., Brookville, Ind.

SEX, female ; Aet, 10 ; temperament, bilio-nervous ; diathesis, scrofulous ; condition, extreme emaciation, anæmia, marked ; mucopurulent discharge from nares ; fistulous opening under right inferior maxilla ; exfoliation of right superior alveolar process from premolar region ; right antral cavity engorged and greatly distended.

History : About one year previous to presentation, the patient fell from a tree and received serious injuries, among others a contusion upon the region of the right superior premolars, premolars at that time were badly decayed. Within a few months an offensive odour was detected, the premolars loosened and pus was discovered exuding from about the necks of the affected teeth, they were removed by her parents.

The offensive condition increased, discharge from the nares, swelling under the right eye indicating engorgement of the antrum, a fistulous tract leading from the seat of trouble, opened under the inferior maxilla and a throwing off, or exfoliation of the dead process.

Diagnosis : Examination with a sharp probe revealed that the diseased tract involved the entire right superior alveolus

from median line to and including the sixth year molar, the hard palate and the lower plate of the molar superior. The temporary cuspid and permanent first bicuspid (it having erupted subsequent to the injury) were held *in situ* by the gum tissue alone. The central, lateral and sixth year molar were quite loose. All evincing and extensive carious and necrotic condition.

Treatment: The first step was to procure an impression of the upper jaw and make a plate of black rubber for the double purpose of supporting the loosened teeth and retaining in position the dressing to be applied after operating. This was placed in position and the teeth of the whole arch securely ligated to it before operating. Then anæsthetising with 4 per cent. cocaine we proceeded with burs, chisels, scrapers and spicula forceps to remove the dead bone as thoroughly as possible.

When the operation was completed (and we should say we found it necessary to remove the temporary cuspid and permanent first bicuspid) the cavity of excavation extended the entire distance from median line to region of second right superior molar, and to a depth that left only a thin plate beneath the antrum, and including the whole alveolar border and the palatine plate one-third the distance to the suture. The roots of the central, lateral and first molar were denuded upon their labial surfaces, and the lateral upon the lingual surface as well.

While operating the instruments were kept immersed in $\frac{1}{1000}$ bichloride of mercury solution and the parts were frequently and thoroughly bathed with the same. A forcible entrance was made into the antrum just anterior to the first molar, and it was thoroughly evacuated, first using tepid water, then a 50 per cent. solution of aromatic sulphuric acid, and a free entrance secured into and through the nasal passages from the antrum. Careful examination failed to reveal the presence of any foreign substance within the antrum, the lining membrane of which, however, was in a highly inflamed condition. Peroxide of hydrogen was freely injected, followed by tepid water, and again by the aromatic sulphuric acid solution. Care was taken to guard against a closing of the opening into the antrum by the insertion of a gutta-percha tent with a button to prevent its being forced into the cavity, and the external wound dressed with boracic acid and a cotton compress, the boracic acid being rolled into the cotton to prevent rapid absorption, and the patient dismissed with

instructions to return daily for renewal of the dressing and injection of the antrum. At the expiration of two weeks the gutta-percha tent was removed and the opening allowed to close. The dressing was then changed twice or three times per week by us, but renewed daily by the parents until discharged at the expiration of three months. Nine months have passed and the patient is in good health, no indications of a return of the trouble are or have been present.

From the first there had been no pus within the wound until after the daily visits were discontinued, and then only slight, and on two occasions, whereupon an application of peroxide of hydrogen was made, the wound bathed with eugenol and the boracic acid dressing applied. Healthy granulations formed from the first, and although bluish-red points appeared and hemorrhage occurred upon slight irritation; exploration failed to reveal the presence of carious bone and the irritation subsided. We prescribed syr. iod. ferrum x min. three times daily and plenty of good wholesome nutritious food. At the end of the first month discontinued the syr. iod. ferrum and prescribed an emulsion of cod liver oil until discharged.

ANTISEPTIC MOUTH WASH.—Dr. W. D. Miller, recommends the following antiseptic mouth wash :

Thymol.....	gr. ii.
Benzoid Acid.....	℥ii. gr. vi.
Bichloride of Mercury	gr. ix.
Tr. of Eucalyptus.....	℥ ss.
il of Peppermint.....	gr. xi.
Alcohol.....	℥ iii. ʒ. ii.

Filter and add sufficient of the solution to a wine glass of water to cause a distinct turbidity. The mouth is rinsed with this mixture twice successively, and may thus be kept perfectly sterilized, the amount of bichloride being too small to cause poisonous effect.

British Journal of Dental Science.

LONDON, MAY 15th, 1890.

DENTISTRY IN FRANCE.

At the present time, Dentistry in France is apparently travelling through a phase of existence not so very dissimilar from the struggle with which Dentistry was engaged at home but four years back. Dental Surgery, like any other Art or Science, has no home, or rather is not at home everywhere; it is cosmopolitan, so we, its students, take an equal interest in its progress, whether in our own land, or in that of another people. There are, however, some points of difference between the position there and the position here before 1878. There, as with us, Dental Diplomas are in existence, which a man can take if he likes. But whereas our Diplomas are granted before 1878, as they are now by the different College of Surgeons, thus ensuring an equal standard for the pupils of all schools. Their diplomas, following the American line is granted by each College to its own students after passing an examination, at the conclusion of the prescribed course of study. The standard of the two Colleges may be the same, but there is no means of ensuring that it shall be so. In any well considered law this is, then, a point which should not be overlooked, unless there is to be a repetition of the state of things existing in some of the United States, viz., that the possession of a College Diploma, even though it may entitle the possessor to the loud sounding title "Doctor of Dentistry," does not give him the right of practising his profession. In the course of an article on another page, the writer points out that these French schools represent two bodies of opinion

—The one wishing State control, the other a continuance of the existing absolute liberty, but equally desirous of raising the standard of teaching, and so elevating the profession. Undoubtedly the “Struggle for existence,” is a powerful lever for urging dentists to fit themselves thoroughly for the combat; and this would in time advance the profession, not only in skill and knowledge, but also in the position it occupies in the eyes of our fellow men. This is, however, not the point; the only true argument that can be possibly advanced in favour of State control, is the protection of the public from unqualified men. If this can be accomplished without passing a special act, then there can be no further argument in favour of establishing what is practically a monopoly. But we deny that this is possible. We believe, that a “Dental Act” is the only means of ensuring that all who call themselves Dental Surgeons, shall have had at least the minimum amount of instruction in an art, of which they profess to be experts. It would hardly be profitable for us to discuss the various clauses of the Act as proposed; this will be better done when they have become law. But we confess we are glad to see the French are not going to allow their register to be flooded, as ours was, by everyone, from the chemist’s errand boy, and the dentist’s page boy upwards, who can get two unscrupulous men to sign their registration forms. Nor can we see any hardship in enforcing an examination on foreigners; if these are qualified, the examination can be but a matter of form, if they are not qualified, and cannot pass the examination, it can only be right and proper to exclude them. Finally, we can only hope they will succeed in enforcing their Act better in France than we have at home.

WE have received the Memorandum of Association of the newly-founded “Dental Association of Victoria.” The objects of the Association are :—To protect professional interests, and suppress malpractice. To originate and promote improvements in Dental legislation. To establish and maintain a Dental Hospital and College. To establish a benevolent fund

for its members. To invest moneys, maintain buildings, etc., for the purposes of the Association. The subscription is £1 1 0 per annum, or a composition fee of £15 15 0. Members are also liable to an additional call, of not more than one guinea in any one year. Any registered dentist is eligible for membership, provided he is of good character, does not advertise, so forth. Mr. L. J. Blitz presented a two-story building in Clifton Hill, "to give the movement a start." It is hoped the Association will receive Government support, in the same liberal manner in which it is given to the College of Pharmacy.

All things are lawful, but all things are not expedient. We suppose it is lawful to rake up old theories, simply, as it were, for the sake of disproving them, but we confess we cannot see the expediency of it. Both Mr. Talbot, at the New York District Dental Society, and Mr. Biggs, at the Odonto-Chirurgical Society, mention the theory, that prognathism is due to a force originating in the body of the sphenoid, and then proceed to disprove it. We certainly thought this was long ago looked upon as one of those wild shots in the dark, which some people prefer to confessing that they do not know. Grant that a late ossification at the baso-spheno-occipital joint could cause prognathism; that idiocy causes this late ossification; how do you account for prognathism in people who are not idiots? for this certainly occurs. Is this due to late ossification? If so, what causes it, since idiocy is not present? Either you must get late ossification of this joint without idiocy, or prognathism without late ossification. If so, what becomes of the theory?

A lay correspondent, having read the account of Dr. Bramwell's experiments, given in our issue of April 15th, writes:—"It is a pity that Dr. Bramwell does not send his hypnotic notes and telegrams more liberally about, the teetotal work would be done at once." Yes, indeed! and in these days when even a Chancellor of the Exchequer is,

apparently, really sorry that we should drink ourselves into solvency, what a public benefactor the man would be regarded as. But nothing shows better the uselessness of the cult for any practical purpose, than the way in which its influence seems to be confined to the favoured few. Should we not have said *weak-minded few*?

The *Edinburgh Weekly News and Dispatch* publishes a letter from a correspondent, signing himself "Forty years a Piper."—In reference to the remarks made by Mr. W. B. Macleod at a meeting of the Odonto-Chirurgical Society, regarding the effect of bagpipe playing on the teeth, which we published in our last issue, he says:—"it would be interesting to know how long the men of the Cameron Highlanders have been at the pipe, and where they got their bone mouth-pieces, as I believe there is no such thing as a bone mouthpiece, and that the teeth of respectable old pipers are not in any way injured by using a properly made bag-pipe."

A CURIOUS STORY is told in the *Jewish Chronicle*: "Professor Billroth, the famous Viennese surgeon, some time ago received a letter from a certain Jew in a small Russian town to come immediately and perform an operation. The professor, in his answer, stipulated for 5000 marks, which was promised him. The professor then repaired to the Russian town, and upon his arrival he was received by a number of Jews, who sorrowfully informed him that the gentleman that was to be operated upon had died and had been buried already. And seeing that the professor felt perplexed and regretted the journey which he had made in vain, the Jews comforted him, saying: 'There is yet some chance for you to make some money here. There are several sick men in our hospital who would require your services, for which each of them would be willing to pay you 1000 marks.' The professor gladly accepted this offer, and after having performed about

five operations the stipulated amount was handed to him. But a few minutes before starting for home the professor learned that he had resurrected the dead man. That worthy gentleman had been among the hospital patients cured for 1000 marks."

New Anæsthetics are ever and anon brought to our notice, each being usually announced, by its foster-parents, as about to supersede all others. This will hardly be claimed for the following, for which the *Dental Advertiser* is responsible, but it is certainly not lacking in originality.—“Henry Dixey says:—that he was once playing in a small Texan town during his early stage days, and having suffered tortures with an aching tooth, at last decided to have it out. On enquiry he learned that the only dentist there was an alleged Indian doctor, whose office was located in a tent in the outskirts of the town. The fellow was an Indian only in dress, however, for in reality he was a type of the untamed cowboy of the plains. “My tooth has been paining me dreadfully,” began Dixey, as he seated himself on the only camp-stool in the tent, “and I want you to give me ether, doctor.” “Ether,” roared the cow-boy dentist, as he swung a huge wooden mallet round his head, “Ether be blowed! We stun ’em here.”

A “LAPSUS LINGUÆ.”—An Irish editor says he can see no earthly reason why women should not be allowed to become “medical men.”

Among the various arts and crafts which will be represented in the Arab Colony at the “Frencheries” at Earl’s Court, will be a dentist, who will place himself at the service of the public, though, says the *Pall Mall*, the instruments he uses seem almost enough to frighten away the worst “devil” of toothache that ever existed.

Manipulative Miscellany.

All new instruments or articles wished to be described under this heading are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

SCOTT'S PULP DEVITALISING EMULSION.

WE have received a specimen of Scott's Pulp Devitalising Emulsion. The glass jars in which the preparation is sent out, are very convenient for dipping in the cotton wool pellets, on which it is usual to apply such preparations to the pulp, it is desired to kill. The makers claim the following special advantages :—

Being in the convenient form of an Emulsion, its consistency is perfectly uniform, and the active ingredients being held in suspension, it is far more reliable in its results, no mixing being required, and much waste is saved.

We tested it in one or two cases, with, as far as we could judge, very satisfactory results.

CAULK'S GUTTA-PERCHA PREPARATIONS.

WE have received some of Caulk's Gutta-Percha filling materials. The Points, for filling roots, are excellent; they are made in graduated sizes, which we do not remember to have noticed in those of other manufacturers. This mode of filling the pulp chamber has become very popular of late, and most deservedly so, minimising as it does the risk of forcing foreign matter through the apical foramen. The Gutta-Percha is put up in cakes, pellets, and cylinders. It is not a new preparation, it has been before the public over ten years, and so has survived the time-test. It works with good plasticity.

Abstracts of British & Foreign Journals.

BRITISH MEDICAL.

THE PERIOSTITIS OF MOTHER-OF-PEARL WORKERS.

FOR some reason, which remains obscure, notwithstanding the careful investigations of Gussenbauer and English, men and women engaged in working at mother-of-pearl are subject to periostitis, which attacks several bones at once, and is very prone to recur. This malady has been seen both at Vienna and Berlin. Dr. W. Levy has published some fresh observations on the disease in the *Berliner klin. Wochenschrift*. He has noted five cases within four years in Berlin, where about 300 mother-of-pearl workers are employed. These workpeople are nearly all adults. The patients were from 21 to 31 years of age, and all five had worked over five years at the trade in question. In the first patient the inferior maxilla was attacked; in the second the left clavicle, and afterwards the lower jaw; in the third the right metacarpal bones; and in the fourth the lower jaw, and afterwards the lower part of the right humerus. The fourth patient had been fourteen years engaged in mother-of-pearl working. During his first year the right scapula was attacked, and two relapses followed in the course of the two succeeding years. Four years later periostitis occurred in the right clavicle. Afterwards the left side of the lower jaw, the left metacarpals, the right femur and the left tarsal bones were involved.

FROM AN ARTICLE ON FATTY TUMOURS.

By J. BLAND SUTTON, F.R.C.S.,
Assistant-Surgeon Middlesex Hospital.

Any tumour composed of fat is called a fatty tumour. They are by no means restricted to regions where fat is found normally; they may occur in a muscle, or in the midst of a myoma, in connection with the brain, spinal cord, or even

grow from periosteum. Besides subcutaneous, subserous, and subsynovial layers of fatty tissue we find, as Virchow has pointed out, the submucous tissue in many situations laden with fat. In the normal state it is true that no continuous layer of fatty tissue exists in submucous tissue, but fat lobules can always be detected in this situation in well nourished individuals. It is thus easy to understand that abnormal collections of fat are possible in connection with mucous membranes. Submucous lipomata have been especially studied by Virchow. He has figured one beneath the mucous membrane of the stomach, near the pylorus, of the size of a nut. Also one from the jejunum, and points out that they may become pedunculated and cause invagination of the bowel. Mr. Sydney Jones removed a lipoma from the right aryteno-epiglottic fold of a man aged 40 years ; it hung down into the pharynx, and the patient could protrude the tumour into the mouth. It was smooth and round, and measured 2 inches in diameter. It was an irregularly lobulated mass of fat ; the lobules were held together by connective tissue. It contained a small cyst lined with stratified epithelium. Laryngeal lipomata are very rare. The most remarkable example on record is one described by Mr. Holt. The patient a man, died suddenly ; hanging from the left aryteno-epiglottic fold, and from the side of the epiglottis, was a pedunculated tumour, which extended into the œsophagus for a distance of 9 inches. It consisted of fat, and was covered with a layer of mucous membrane. Fatty tumours also arise in the connective tissue between muscles, and in such situations may attain a very large size. They have been found between the greater and lesser pectorals ; several have been removed from between the muscles of the tongue, and very large ones from the intermuscular stratum between the oblique muscles of the abdomen. One of the most remarkable belonging to this variety is that known as the sucking cushion. In dissecting the cheeks we find lodged between the masseter muscle and the buccinator a mass of fat, which comes, anteriorly, in close relation with the ordinary subcutaneous tissue of the cheek. This fat is lobulated, and during dissection may be easily shelled out by means of forceps ; it is often termed the *boule graisseuse de Bichat*. Ranke has recently drawn attention to this under the name of "*Saugepolster*" (sucking-cushion). It is believed they exercise an important function in the act of sucking by distributing atmospheric pressure, and preventing the buccina-

tors from being forced between the alveolar arches when a vacuum is created in the mouth. Whatever their function, it is certain they are relatively larger in infants than in adults. Ranke also points out that in emaciated children they are only slightly diminished in size, even when there is scarcely any subcutaneous fat on the body. These pads offer a remarkable contrast to the camel's hump, for this is said to get smaller when it performs long and toilsome journeys. The sucking-pads occasionally enlarge in adults, and M. Paul Berger relates a case admitted into La Charité with a large calculus impacted in Steno's duct. The irritation consequent on this accident caused enlargement of the pad. The term Parosteal Lipomata has been applied to fatty tumours arising in connection with periosteum. They constitute an interesting group, as they give rise to great difficulty in diagnosis. Although the published accounts of such tumours are not numerous, yet I believe parosteal lipomata are not rare. Their special features are the following : as a rule they are congenital, and nearly always contain tracts of striped muscle fibre. Dr. Fred Taylor reported a case of fatty tumour growing from the front of the bodies of all the cervical vertebræ ; it projected into the pharynx, and bulged on each side of the œsophagus, simulating a postpharyngeal abscess. The patient was a little girl aged 4 years.

THE LANCET.

DEMONSTRATION OF HYPNOTISM.

On Friday the 11th inst., Professor Bernheim of Nancy, gave some curious demonstrations of hypnotism at the Hôtel Dieu, when Drs. Charcot, Dumontpallier, and Brouardel, and many leading members of the legal and literary professions were present. Dr. Bernheim here developed the doctrine of the School of Nancy, which teaches that suggestion is the basis of all the phenomena of hypnotism. According to the author, there is suggestion in everything, and it plays a part in all actions good or bad. This theory is very important from a medico-legal point of view, as it tends to support the statement that the greatest criminals are not always the most culpable, as they may be irresponsible victims of suggestion

or of auto-suggestion. Dr. Bernheim was able successively to suggest hallucinations of motility or of sensibility, then hallucinations of acts—in creating in the awakened subject imaginary recollections of stealing, which he terms “retro-active hallucinations”; and thus proved the readiness with which false witnesses, really believing in their own good faith, might be created. Their conviction is firmly founded, and they even amplify the statement which was suggested to them by adding to it details of their own invention.

In a note communicated to the Academy of Sciences *a propos* of this subject, Professor Charcot made the remark that a great deal was being said and written about hypnotic suggestions, and he feared that it would end by suggesting to everybody that everything was suggestion, and that we only exist by suggestion. He considers this as going at too rapid a pace, and concluding too quickly. The question was not so simple. He thought it was necessary to be able to well define the subjects on whom one is to operate, and to guard against simulation. One ought first to know whether a subject was really asleep when he assumes to be so. M. Charcot has discovered a new means by which to decide the question; that is, by analysis of the urine of twenty-four hours. If the hysterical subject has really slept, this may be demonstrated by prolonging the experiment and examining the proportion of urea. The chemical analysis will reveal whether simulation is being practised or not, and forms a means of verification not within the reach of the subject. Dr. Charcot concludes his note by advising great prudence in our conclusions on experiments in hypnotism and on young hysterical subjects.

Mr. Henry Blandy, L.D.S., Edin., writes to *The Lancet*:—I received this morning a marked copy of *The Lancet* drawing my attention to this subject, perhaps because in 1885 I published some notes of an experience of tooth extractions under mesmerism at the hands of Mr. Kershaw, in Nottingham, in the journal of the British Dental Association. My experience of the successful character of the anæsthesia induced quite coincides with the report of the cases operated upon at the house of my friend, Mr. Carter, of Leeds, but my conclusions were decidedly adverse to the general employment in our surgeries for several reasons, which I would

venture strongly to urge upon those who may be disposed to dabble in this mysterious force. 1st. Its non-applicability to every patient. I sent Mr. Kershaw a girl of sixteen to mesmerise, and he could not influence her one bit. The only cases I operated on were persons who had been under his influence for some time. He admitted candidly that many persons were intractable, and that it took him months before he could bring on this somnolent condition in others. Supposing a patient needed several aching teeth extracted, this would be, to say the least, inconvenient. 2nd. Mesmerism seems to demand in the patient a weakened nervous constitution. The persons most susceptible, who perform, at the will of the operator, the most ludicrous and disgusting antics on the platform, are men and women of a low nervous and intellectual type, and mesmerism must be a great shock to their nerve organisation, and also to their moral force, since they feel and know they are completely at the mercy of some man should he be near, or, as in the case reported of Dr. Milne Bramwell, should he even write a letter or send a telegram. The anæsthesia of chloroform, ether, or gas passes away, and there is no fear of its repetition, without the deliberate act and consent of the patient; that of the once mesmerised may recur, and the very imagination that it may, must be a constant terror to the understrung patient. Dumas, in his "Memoirs of a Physician," fully describes this in the tyrannous control that Acharat or Joseph Balsamo had over his victim Lorenza. 3rd. I hold it would be very injurious to the practice of any medical man or dentist to have the power of mesmerising his patients, or be thought to have it. Dr. Elliotson, of University College Hospital, ruined himself by it, and I fear very much that the tongue of slander would not spare us in this generation. In the sixth volume, p. 124, of the *British Dental Association Journal* will be found an able letter from "Psychologist," offering objections of a more scientific character than mine. It is no new thing, as in *The Lancet* of June, 1870, p. 841, it will be found that a committee of physicians and surgeons of eminence was formed to investigate experiments conducted by Dr. Esdaile, in India, and the operations were quite successful, and of very much more serious and extensive character—amputations of thigh, scrotum, &c. I confess these manifestations are exceedingly interesting, and at first sight seem to indicate a discovery in the great world of anæsthetics; but I trust the profession will halt in its opinion until it has studied the question all round.

ON SENSATIONS REFERRED TO THE MOUTH.

By J. HILTON THOMPSON, M.D., Vict.

Late Senior Resident Medical Officer to the Children's
Hospital, Pendlebury.

MRS. B—, a lady of forty-nine years of age, noticed about five months ago tingling sensations in the tongue, the mouth at the same time feeling hot and dry. The tingling increased in intensity, until the tongue felt as though the ends of numerous small wires were being pressed against it. This sensation was more marked in the posterior two-thirds of the organ. The sensation of heat also became more marked, until the tip of the tongue, palate, and gums seemed to burn. These sensations were worse at night, and interfered materially with the patient's sleep, she also stated that she frequently suffered from a feeling of distension in the epigastric region, also from scalding eructations, occasional palpitation, and pain between the scapulæ. On examination I found the patient anæmic and depressed. The thoracic organs were apparently normal; the liver was not enlarged, but there was slight pain on pressure over it; the stomach was dilated, but not painful on pressure: the tongue small, dry, and covered with a thin white fur, through which large and congested papillæ projected at the sides and tip; bowels constipated; kidneys normal; old laceration of perineum and cervix. The patient had no teeth in the upper jaw, but wore artificial ones attached to a suction plate; this, however, did not appear to have anything to do with the symptoms complained of, for they continued after the plate was removed; sense of taste less acute than normal, but not markedly affected. Supposing the condition of the mouth to be secondary to a disordered state of the digestive organs, I prescribed in the first place terebene purus, hoping that it would relieve distension and arrest the cultivation of organisms. The bowels were regulated by means of podophyllin and small doses of calomel. At the end of a week the patient had improved, the above treatment was stopped, and a mixture of liquor pepsini porci, with hydrochloride acid, ordered; massage over the liver performed every day; diet limited to starches and milk. The patient

improved rapidly, and now the pricking and burning sensation have quite disappeared. In this case there was nothing in the condition of the mouth or tongue to account for the symptoms ; but the fact of the sensations diminishing in intensity, and finally disappearing as the condition of the digestive system improved, make it probable that the sensations complained of were the result of an irritant acting on the nerve endings in the stomach, and that the resulting sensations were referred not to the seat of the irritation, but to the tongue. When it is remembered how closely united are the origins of the vagus and glosso-pharyngeal nerves in the medulla, and how intimately connected in the first part of their course, we would appear to have a reflex tract that would at least account for sensations of pain in the posterior part of the tongue ; moreover, we know that irritation of the fibres of the glosso-pharyngeal in the posterior third of the organ produces nausea and vomiting (Volkmann), this is the result of a reflex from tongue to stomach, consequently a return reflex from stomach to tongue is all the more probable

LEUCOPLAKIA OF THE TONGUE.

Dr. Rothman, writing on leukoplakia of white patches of the tongue, describes ten cases of this affection which have come under notice in Professor Bergmann's clinic in Berlin. The liability of these patches to become carcinomatous, which was first pointed out by Mr. Hulke, is so well recognised that Dr. Rothman says the patches may take on malignant characters, even after they have existed for thirty years. As to treatment, it was found that the best plan was to destroy them entirely with Paquelin's cautery, though of late Peru balsam has been employed with success.

THE NEW YORK STATE DENTAL STUDENTS' SOCIETY JOURNAL, *The Record*, mentions an experiment of the late Seth Green, of Rochester, N. Y., the fish-culturist, on a voracious trout which had a propensity for biting its companions. Mr. Green extracted a few of the trout's teeth and the biting ceased.

DENTAL COSMOS.

THE DECOMPOSITION OF THE CONTENTS OF THE DENTINAL TUBULES AS A DISTURBING FACTOR IN THE TREATMENT OF PULPLESS TEETH.

BY W. D. MILLER, P.H.D., D.D.S., BERLIN.

IN many of the recent discussions on the treatment of pulpless teeth or teeth with foul pulps, particular stress has been laid upon the supposed necessity of pursuing such a course of treatment as will bring about a complete sterilization of the contents of the tubuli in the dentine of the root. It has been claimed that otherwise decomposition of such contents will follow, gases and other products of putrefaction will work their way through the dentine and cement and keep up a perpetual bombardment upon the pericementum, resulting in chronic or possibly acute inflammation of the same.

These claims do not appear to me to be in accord with clinical experience, nor are they, as far as my knowledge of the literature of the subject goes, based upon experimental evidence. It has been my experience that in all cases where we have a straight wide canal, so that we can remove all traces of the pulp and thoroughly cleanse the canal, regardless of the tubuli, we may count upon success with almost, if not quite, absolute certainty.

In proportion as the canal becomes narrower and tortuous, rendering the thorough cleansing difficult or impossible, in the same degree the probability of a successful treatment will be diminished. It is a matter of continual experience that an inflammation of the pericementum, either acute or chronic, will disappear with astonishing rapidity upon the total extirpation of the putrid pulp and application of almost any antiseptic, which would scarcely be the case if the decomposition of the contents of the tubuli were an important factor in the disturbance. Again, in all cases where trouble has arisen after treatment I have been able to trace it either to irritation of the periapical tissue by careless treatment or over-treatment, or to an imperfect cleansing of the canal.

What, however, from a clinical aspect seems to tell most strongly against such a view is the fact that trouble subsequent upon filling occurs invariably first at the point of the root, where it may remain localized or spread to a greater or

less portion of the pericementum, whereas any trouble arising from the decomposition of the contents of the tubuli we should expect to begin near the neck of the tooth, where the decomposition must first take place, if at all, and where, on account of the thinness of the cement, the gases might most easily penetrate to the pericementum.

Dr. N. S. Jenkins (Dresden) expresses himself upon this subject as follows : "It is my conviction that no inflammation of the pericementum takes place when the pulp has been *thoroughly* extirpated, and the canal, pulp-chamber, and crown cavity *properly* filled. I have never known a case where there was any reason to suspect pericemental inflammation to be caused by the decomposition of the contents of the dentinal tubules. The inflammation could always be more reasonably accounted for, it invariably seeming to be the result of defective manipulation or of pre-existing necrosis."

It is not my intention, however, to discuss this problem from a clinical point of view, but rather to give the results of a few investigations of a scientific nature which I have made in reference to this question, and the conclusions which may be drawn from them.

In the first place, we must bear in mind that the only decomposition which would take place in the dentinal tubules is one which might be brought about by bacteria ; in other words, putrefactive decomposition, or simply putrefaction. In the event of such a decomposition of the contents of the tubuli taking place, a great variety of substances might be produced, chiefly, however, ammonia (NH_3), sulphuretted hydrogen (SH_2), Hydrogen (H), carbonic acid (CO^2), a variety of acid and alkaline substances such as formic, lactic, acetic, and butyric acids, carbonate of ammonia, propylamine, trimethylamine, etc., and finally the ptomaines.

It must not be supposed, however, that all these substances would be produced in any one case. How many of them might be formed would depend upon whether it were a pure or a mixed infection,—*i.e.*, whether the tubules had been invaded by one or more kinds of bacteria.

The products of decomposition arising from the action of a single kind of bacterium are, according to the few observations yet made, limited in number, stinking gasses being most frequently represented, then peptone, ammonia, trimethylamine.

Nor should it be taken for granted that the quantity of gas produced in a case of putrefaction must necessarily be very

great ; as a rule it is insignificant when compared with the amount of gas produced by the fermentation of carbohydrates.

Bearing in mind that the putrefaction of the contents of tubules can take place only under the action of micro-organisms, naturally the first question to be answered is, Whether and to what extent do micro-organisms from the root-canal penetrate the dentinal tubules ?

At first thought the probability of an extensive invasion of the tubuli does not appear very great. The diameter of the normal tubuli, particularly in the root, is, it is true, considerably greater than that of most bacteria, so that on this score there would be nothing to prevent their entrance. It has been found, however, that the putrid dental pulp is often devoid of micro-organisms. This condition is not difficult to account for, because we know that all the nourishment contained in a pulp may soon be exhausted, and where the pulp-chamber is closed so that no fresh material is admitted from without, the micro-organisms may perish from want of nourishment, or they may be devitalized by the prolonged action of their own products. These two causes would also operate in a much higher degree in the narrow tubuli of the dentine. Add to this the fact that the access of air must be exceedingly limited, so that the aërobic bacteria could probably not live in the tubules for any length of time, and I think we would be justified, *a priori*, in regarding the tubules of sound dentine as not particularly favourable media for the cultivation of bacteria.

These are, however, only theoretical considerations ; the question as to whether an invasion of the tubules actually takes place or not can be settled by microscopical examination alone.

With this object in view I prepared sections of nineteen roots, all of which, with one exception, contained remains of putrid pulps, while four of them were abscessed.

The roots were sawed into lamellæ about one millimeter thick and placed in a ten per cent. solution of hydrochloric or nitric acid, in which they became softened in a few hours. They were then soaked in water (repeatedly changing) to remove the acid, cut on the freezing microtome, stained by the Günther modification of the Gram method, and mounted in the usual manner in Canada balsam.

The examination of these sections revealed in many of them a condition which, while being well known to be the normal

condition in the tusks of elephants, for example, has not, I believe, attracted attention in the human teeth.

In ten of the roots examined I found the canal to be completely or partially lined with a substance of a homogeneous or globular structure, containing very few or no canals but occasionally a formation resembling a bone-lacuna, and on the whole bearing much more resemblance to cement than to dentine. This layer is impermeable to micro-organisms, and acts, therefore, as a safeguard against the decomposition of the contents of the tubuli.

Open roots which serve as retaining centres for food-particles undergo the natural process of decay, by which the lumen of the canal is gradually increased. The phenomena of decay here are the same as those in decay of the dentine of the crown and neck of the tooth.

A microscopical examination of the sections prepared as above stated gave the following results :

No. 1. Section near open end of root showed decay and extensive infiltration of the tubules ; section near apex appeared lined with the impermeable modified dentine, except at one point, where a few cocci may be seen in eleven of the tubules.

No. 2. Two sections from near the middle of the root ; both show the modified dentine. In one piece four tubules are infected, in the other none.

No. 3. Sections near the open end of the root show decay ; those near the apex are lined on one side of the canal by impenetrable modified dentine without tubules ; on the other side four tubules contained a few cocci.

No. 4. Inner layer again destitute of tubules ; no infiltration whatever.

No. 5. Section near open end decayed ; section near apex shows about one-fourth of the canals infected with straggling cocci to a depth of one-fourth to one-half millimeter.

No. 6. The end section is slightly decayed and correspondingly infected. The section near the apex is protected on one side by tubeless dentine ; on the other side eighteen tubules are infected by a few straggling bacilli to a depth of one-half to three-fourths millimeter. A few of the tubules contain also cocci, from which we must conclude either that the dentine is infected with two kinds of bacteria or with a pleomorphic bacterium.

No. 7. The root in this case contained an inflamed pulp ; no trace of tubular infection is anywhere to be discovered.

No. 8. Section from about middle of root : twenty-six of the tubules are affected with cocci to a depth of about one-tenth millimeter.

No. 9. The sections show again that the canal is in part lined with modified dentine. In two or three tubules only was I able to find about a dozen bacteria. The root was abscessed.

No. 10. The canal was found filled with masses of bacteria, but no infection of the tubules worth mentioning could be detected, only a few cocci being visible in three or four tubules. The canal was again partly lined with modified dentine. Root abscessed.

No. 11. Abscessed root. Section near the pulp-chamber shows nearly all the tubules infected to the depth of one-fourth millimeter. Section near apex free from infection.

No. 12. Ground section from near the middle of the root ; no infection of the tubules whatever.

Nos. 13 and 14. Both partially protected by modified dentine, and both free from infection.

No. 15. Canal lined by a layer of modified dentine one-fourth millimeter thick. No micro-organisms visible in any of the tubules.

No. 16. Section from about the middle of a small root, showing a few of the tubules infected to the depth of one millimeter.

Nos. 17-19 give results corresponding to those noted above, the bacteria having penetrated a very few of the tubules to a distance varying from one-twentieth to one-fourth millimeter.

The conclusion at which I have arrived through the examinations, if I may be allowed to draw any conclusion at all after an examination of only nineteen cases, is that we need pay no regard whatever to the contents of the tubules in the treatment of root-canals. The tubular infection is so superficial and so slight that an action upon the pericementum appears to me to be altogether out of the question. The first glance at the preparations under the microscope at once impresses one with the inadequacy of the infection to perform the action attributed to it. Of the cases I examined there was only one in which there could be at all a possible question of a deleterious action produced upon the pericementum by a decomposition of the contents of the tubules. Let us see what are the probabilities that such an action really existed.

In the first place, it may be remarked that the root was

not abscessed as were many of the others, which showed less infection. In the second place, we may reasonably suppose that the infection of the dentine would have been less extensive if the canal had been subjected to proper antiseptic treatment; as it is, about one-tenth of all the tubules contain bacteria more numerous toward the canal, very sparingly in the deeper parts of the dentine.

Three ways suggest themselves by which products of decomposition forming in the infected zone may reach the pericementum.

1. The gases accumulating in the tubules might be supposed to force the contents of the tubuli before them through the narrowing tubules, the stratum granulosum, and cement directly upon the pericementum. Personally, I place such a process entirely out of the question for the following reasons: There is no trace whatever of any change to be detected in the structure of the dentine which might indicate a development of gas in the tubules. Again, we find the tubules gradually narrowing and becoming finely branched as we approach the cement, and, bearing in mind that the contents of these tubules not being infected cannot have undergone any change, we find it impossible to explain how products of decomposition from the infected district could force the contents of the tubules through the gradually narrowing canals, through the stratum granulosum, and through the cement to the pericementum.

2. Gases may break up the union between the fibrils and the walls of the tubules, and so, without dislodging the contents of the tubules, make their way gradually along the tubuli, etc., to the pericementum. Aside from the fact that the sections reveal no trace of such action, I conceive that it would require an enormous pressure to force bubbles of gas from the infected zone to the surface of the cement.

3. The most probable, and, I think, the only way in which gases might possibly be supposed to penetrate from the decomposing fibrils to the pericementum is by a process of diffusion. This, naturally, would apply only to such gases as are soluble in the fluids of the tubules. That an action of this nature does take place will be witnessed to by the fact that in drilling into a tooth containing a putrid pulp, *as we near the pulp-chamber*, the boring will sometimes be found to have an odour of putrefaction. I have not observed, however, that this odour could be detected from the more superficial layers of dentine, though Dr. Jenkins writes me that in

chalky teeth he has noticed the odour soon after boring through the enamel. Now, it is quite possible that a similar action, in a diminished degree, may take place through the solution and subsequent diffusion of gases generated in the tubules themselves, though such an action would always remain insignificant when compared with the absorption of gases from the pulp itself ; and the possibility that the whole substance of the root may in this way become permeated with the products of decomposition, and to such an extent that they should have an irritating action upon the pericementum, is very slight indeed.

In conformity with the observations which I have made in practice and with the results of my theoretical and experimental examination of this subject, I am in the habit of utterly disregarding the contents of the tubuli. If I am able thoroughly to extirpate the pulp and antiseptically cleanse the canal, I have nothing to fear or to anticipate through decomposition of the contents of the tubuli.

HICKORY ROOT FILLING.

Dr. White has filled straight roots with hickory for eighteen or nineteen years. He does not fill the entire canal—not more than one-eighth of an inch at the apex. The object in using it, is to know that the foramen is closed ; then you can fill the root with anything desired. The method is to file a piece of well-seasoned dense hickory almost to a point, then pass it up to the apex. If there is the slightest indication of pain, withdraw the wood, cut off a short piece from the end ; again insert, mark at the cutting edge of the tooth : then again withdraw, and with a sharp knife, make a groove around it, about an eighth of an inch from the point, and bend the end over without breaking it off. Insert for the last time, the proper position being indicated by the groove, tap it home, and twist off the point.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

ORDINARY MONTHLY MEETING, held April 14th, 1890,
Mr. Felix Weiss, L.D.S., President, in the chair.

THE minutes of the preceding meeting having been read and confirmed,

Mr. JAMES H. REINHARDT, L.D.S.I., signed the Obligation Book, and was formally admitted a member by the President.

The Librarian (Mr. ASHLEY GIBBINGS) stated that he had received the usual periodicals. He had also received a number of invitations for Members of the Society to attend the forthcoming International Medical Congress to be held in August at Berlin, together with copies of the rules and sectional programmes.

The Curator (Mr. STORER BENNETT) said that he had received from Mr. C. Robbins, for the Museum, the skull of a rabbit which had been injured during life in such a manner that the lower incisors had become greatly overgrown, while the upper ones from non-use had been also excessively developed, the left one having been deflected to the right side so that it crossed the middle line, and, causing absorption, the tip had become imbedded in the hard palate on the right side.

Mr. Robbins had also sent for exhibition the skull of another rabbit kindly lent by the Editor of the *Field*, in which the right lower maxilla presented an un-united fracture, which had produced a very similar overgrowth of the hard palate on the right side by the left upper incisor. The right upper incisor was also interesting from having been previously fractured and united.

Mr. Redman had presented a supernumerary tooth removed from the space normally occupied by the left upper incisor, the tooth was much stunted and the apex of the fang presented the appearance of being invaginated into the crown.

Mr. Henry Sewill had presented eight microscopical slides of sections of teeth, chiefly representing various phases of caries, many showing stained micro-organisms very beauti-

fully. He had also sent seventeen photo-micrographs illustrating the subject of his paper that evening.

The PRESIDENT said the Society must feel very grateful for the donations which the Librarian and Curator had just mentioned, and he hoped they would express their thanks to the donors. He then called upon Mr. Scott Thomson for his casual communication, remarking that it would be best to take the discussion upon the "Casuals" all together after the last one.

Mr. SCOTT THOMSON demonstrated a splice for dental engine bands. He said that the difficulty experienced by many in making a satisfactory join, especially with the cord used for the Bonwill engine, would, he hoped, be a sufficient apology for bringing before the Society a method which was not original and which had appeared in a recent number of the *International Dental Review*. Taking first the S. S. White-driving band, which consists of a plaited sheath without a core, the necessary length is measured and about five inches extra allowed for the splice. A needle is required which may be constructed by doubling upon itself a piece of piano wire and fastening the ends in an excavator socket-handle with pewter solder. In order to facilitate the description the respective ends of the core will be called A and B.

First: pass the needle unloaded through the meshes of the sheath four and a-half inches from end A, then along the inside for a distance of two inches and out again. Second: thread end B, which has been slightly unravelled, in needle, and withdraw through sheath, leaving half-an-inch projecting. Third: pass needle in a similar manner four and a-half inches from end B, and out again at the exact place where B has been ensheathed in A. Fourth: end A is threaded in needle and withdrawn. Fifth: both projecting ends are cut off and cord pulled firmly, when cut ends disappear inside the sheath. Where a round cord with a core is used, such as with the Bonwill engine, the cord is cut out for the exact length of the desired splice, which, if carefully made, will not be easily detected. No stitching is necessary, as the greater the tensions of the band the firmer the splice holds.

Mr. MAGGS then read notes of a case of defective development of the permanent teeth, associated with malformation of eyes and anus. Models of the patient's dentition were shown.

Rose S., aged eighteen years, was admitted into Guy's Hospital under the care of Mr. Brailey, for chronic glaucoma of both eyes.

Family History.—She is the eldest of six children, and her grandmother states that she is a full-term child. Her three brothers died in infancy from convulsions; her two sisters, aged respectively seventeen and thirteen, are living and well; the father is in good health, aged about forty-one; the mother died of consumption at the age of thirty-seven.

Present Condition.—The patient is of medium height and dark complexion, with fairly developed head and face. Her hair is dark in colour, full in quantity, and fine in texture. The eyebrows and amount of hair on the body are normal, and there is some hair on the upper lip; her nails are well developed. She seems very slow mentally. Her anus was imperforate at birth, and had to be established by operation.

Dental Notes.—*In the upper jaw* there are one temporary and six permanent teeth. All the incisors and permanent molars are absent; but one temporary molar remains between the premolars on the right side. There is absence of the alveolar process between the canines. The palate is flat. *In the lower jaw* there are ten teeth. *On the right side* the incisors, second premolar, and the wisdom tooth are absent, but a caniniform supernumerary tooth is present between the canine and premolar. *On the left side* the canine, second premolar, and the wisdom tooth are absent.

Ophthalmic Notes.—Mr. Brailey has favoured me with the following notes relative to her eyes:—Each eye is very deficient in size (microphthalmos). There is almost complete absence of irides, but the lenses are present, as ascertained by oblique illumination. Each eye has thirteen dioptries of myopia, as ascertained by keratotomy. This myopia is not improved by spherical glasses. The ophthalmoscope shows the discs to be small. There is no coloboma of choroid, but a few patches of opaque nerve fibres are seen in the retina. Vision is defective in each eye. Mr. Brailey finds nothing suggestive of specific disease.

Remarks.—The patient asserts that she has never had any teeth in the front of the mouth. There is some difficulty in naming several of the teeth, especially the two lower ones on the right side of the median line, and the last tooth on each side of the upper jaw. The canine teeth are peculiarly peg-shaped, whilst the upper teeth that I have named second premolars have two distinct cusps on the outer masticating surfaces, and simulate molars. There is a general tendency to

dwarfing of the teeth, which are well covered with enamel, and free from caries. The interest of the case centres chiefly in the fact that the teeth and eyes, which are mainly dermal organs, are malformed, the teeth being, in addition, defective in number. It is further interesting in that the nether portion of the alimentary canal, the anus, also of epiblastic origin, was imperforate.

The case was brought before the Society mainly as an association of congenital defects of organs derived from the same embryonic layer, viz., the epiblast.

Mr. BARRETT showed a home-made electric lamp. He explained that this consisted essentially of a sixteen volt incandescent lamp, behind which was a reflector, and in front of which was a convex lens. These were mounted upon a wooden base, 8in. by 3in. in size, and were enclosed in a copper tube. The lamp, thus constructed, was placed upon a swinging arm, to which it was attached by a ball and socket joint. The power was derived from a storage battery. The advantages possessed by this lamp over that which was placed within the patient's mouth lay in the absence of a light to dazzle the operator, and in the freedom allowed of using his left hand. Mr. Barrett also showed an artificial fulcrum of vulcanite which enabled him readily to extract with an elevator the stump of a difficult lower wisdom tooth. The first and second molars on the same side were absent, and a previous attempt with the elevator and forceps had failed. A small vulcanite side-piece was then constructed to a model of the lower jaw, and, being held firmly *in situ* by a lower bicuspid tooth, which it embraced, it proved a perfectly steady and rigid fulcrum when the elevator was again employed.

The PRESIDENT then called upon

Mr. HENRY SEWILL, who said that although he had spoken and written about dental caries perhaps more than most men in the Society, he was ashamed to say it was only in recent times he had made a thorough research into the nature of the disease. He did not think he would have undertaken the work now had he not been fortunate enough to secure the co-operation of Mr. Pound, of King's College, who was an expert of experts in bacteriology. Mr. Sewill had a large number of sections now, more beautiful he believed than had ever before been prepared, and this had been an inducement for bringing before the Society a subject upon which he had nothing new to tell them. Another inducement was, that he had been fortunate enough to interest Mr. Andrew Pringle,

whose reputation as a physiologist and photomicrographist was well known. If he (Mr. Sewill) were to stop to express his obligation to every scientist to whom he was indebted his list would be a long one, but he would especially mention Mr. Arthur Underwood, Mr. Charters White, and Mr. Charles Tomes. Mr. Sewill particularly dwelt upon the value of Mr. Underwood's work. The facts which he published in 1881 were all fully confirmed by Mr. Sewill.

The following slides were then exhibited, Mr. Sewill commenting upon them as they were shown :—

Slide 1.—A section of developing tooth of a cat, by Mr. Charters White ; magnification 160 diameters on the side, and 5,120 on the screen. Examination of the process of tooth development demonstrated that the nutrient supply of enamel came from the vessels of the dental sac. The dentine commenced to be calcified before the enamel, and except the external supply there was no vascular supply nearer than the dentinal pulp, and this was cut off by the mass of dentine. It was difficult to imagine the nutrition of the enamel pulp from the dentinal.

Slide 2.—A section of developing dog's teeth, prepared and stained by Mr. Arthur Underwood ; magnification on the slide 240 diameters, on the screen, 7,680. Enamel cells forming enamel, dentine and odontoblasts were all clearly visible.

Slide 3.—Section of enamel organ ; 650 diameters on the slide, and 21,000 on the screen. Forming enamel, enamel pulp, and external enamel cells, all well defined.

Slide 4.—Section of odontoblast layer and developing dentine. Slide, \times 650, or screen, \times 21,000.

Slide 5.—A section of enamel, by Mr. Arthur Underwood, stained with chloride of gold. This was an exceedingly good section, and a good photograph. \times 650 ; and on screen \times 21,000.

Slide 6.—Section of dentine stained with carmine, by Mr. Arthur Underwood ; magnified 650 diameters on the slide, and 21,000 on the screen. Showing the point of junction with enamel, into which tissue some tubes could be seen to run.

Slide 7.—Transverse section of dentine, unstained, by Mr. Charters White ; \times 650 on slide, \times 21,000 on screen.

Mr. Sewill said he had expressed shame that it was only lately he had investigated the pathology of caries thoroughly, but the shame he felt was mitigated by the fact that he held

now, and had always held, that on anatomical grounds alone it was impossible to accept any explanation of the pathology of caries different from that which had been propounded by all modern authorities having valid claim to that title. All observers, though they might differ in some small details, had come to the conclusion that caries was entirely due to external agents and quite devoid of any true pathological phenomena.

There was not the least doubt in Mr. Sewill's own mind that to imagine the presence in enamel of any physiological elements capable of pathological action was quite absurd. Protoplasm could not live isolated; it must be nourished. The physical characters of enamel, the absence within it of demonstrable organic matter beyond a trace, the impossibility of imagining physiological activity in the calcareous basis of such a tissue, and the difficulty in believing in conveyance of nutrient and waste matters to and fro by the dentinal fibrils—these and many other such facts negatived the hypothesis.

Slide 8.—Section from a tooth unaffected by caries showing inherent structural defect in enamel, by Mr. Charters White. Magnification, 150 diameters on the slide, and 7,800 on the screen. Granular enamel plainly seen, and a crack in part of it. This tooth to the naked eye presented no defect.

Slide 9.—A section of enamel showing inherent flaw, a fissure and granular-tissue from a tooth free from decay and presenting no naked eye appearances of defect. Same \times a No. 8.

Slide 10.—Section of tooth showing inherent defect—globular dentine extending in strata beneath the enamel, alternately with well-formed tissue; \times 80 on slide, 2,560 on screen. Mr. Sewill said that, when expressing his opinion based upon anatomical grounds, he had not been unmindful of the researches of Gallippe and Hoppe-Seyler, who had tried to prove that teeth gained in density as age advanced. The only way to prove that teeth gained in density would be to cut sections from the same tooth at different periods of its existence, but even then the result would be very fallacious, as was proved by the sections just shown, since the density of both enamel and dentine varied very much at different parts of the same tooth, and teeth in the same set were usually of very variable density. The study of inherently defective enamel and dentine largely explained the etiology of dental caries. It largely explained the incidence of the disease, and

the extreme variability in its rate of progression in different cases.

Slide 11.—A typical section of the orifice of a cavity illustrating caries proper, magnified 80 diameters on slide and 2,560 on screen. Mr. Sewill remarked that Mr. Pound had in the course of the investigation cut and stained some eight dozen sections. Care had been taken to cut a large number from teeth the pulps of which had long been dead ; the appearances were the same as in living teeth without exception ; in every case the dentinal tubes were found filled with organisms. Quite recently he (Mr. Sewill) had met with a lady having a carious re-inserted natural tooth. Mr. Pound had cut a considerable number of sections from this tooth, and caries was shown to be absolutely the same in it as in a living organ ; some of these sections were shown under the microscope that evening. Mr. Sewill further stated he had received from Professor Miller of Berlin a series of slides illustrating caries artificially produced out of the mouth identical with that produced in the mouth. Several of the slides of artificial and natural caries had been mixed, and Mr. Arthur Underwood and Mr. Pound and he himself had endeavoured to separate them, but none of them had been successful. In essential points the artificial was identical with natural caries. Mr. Underwood had noticed some specimens in which organisms although on the surface were not in the tubes ; and Mr. Pound had pointed to the fact that bacterium termo and torolu seemed more plentiful in artificial than in natural caries. Of the bacteria present in caries the micrococcus is the most frequent. They are found in groups, pairs and chains. Dr. Miller says the pairs and chains are agents of lactic acid fermentation. Leptothrix is found in all cases, especially on the surfaces. Bacteria proper—rods of varied length—are found everywhere. Torula, one of the true fermentation organisms, was present, but not in great quantities, particularly on the surface among food *debris* and also in the tubes. Bacilli, commas, also spirilla and spirachæta were common in all parts.

Slide 12.—A deeper section of the same tooth as slide 11, magnified 160 diameters on the slide, and about 4,480 on the screen, showing the organisms penetrating along the tubes.

Slide 13.—A thinner section than the last, magnified 650 on the slide, 20,000 diameters on the screen. Point of junction of healthy and carious dentine. In this the micrococci could be seen forming pairs, groups and chains. This section to the naked eye would look healthy.

Slide 14.—A section of about the most advanced caries possible to cut a section of, magnified 650 diameters on the slide, and 21,000 on the screen. Tubes mainly occupied by cocci, but other varieties also present.

Slide 15.—A beautiful specimen showing tubes mainly filled with leptothrix. Why it so often happened that one organism was more abundant than another it was difficult to say. This section was magnified 20,000 diameters on the screen.

Slide 16.—A transverse section of carious dentine ; magnification of photograph 650 diameters, 21,000 on screen. The tubes in this case were mainly filled with leptothrix.

Slide 17.—Photograph of scrapings of carious tooth ; comma bacilli, rods, a bundle of leptothrix, micrococci and various organisms. This was a comparatively easy preparation to make. It was merely necessary to scrape the surface and stain a portion.

Slide 18.—Section of " pipe stem " appearance, etching out of the tissue by acid. This and the so-called zone round the area of caries was once thought to indicate vital reaction in dentine, but it occurred in dead teeth ; it was simply due to softening of the dentine. It was not necessary to multiply specimens ; those shown were typical of the different phases of caries. He hoped that a great many other individuals would go into the research of caries. It was really so simple that he did not see why students in every school should not go through the whole process.

There were a vast number of demonstrated and demonstrable facts ; in the first place there were anatomical facts which negatived the possibility of pathological action in enamel and dentine ; there were the facts connected with predisposing causes—existence of inherent structural defects in the tissues ; the fact that agents exist in the mouth capable of destroying dentine and enamel ; the fact that caries is the same in teeth with living pulps and pulpless teeth. Then there was the fact that in teeth replaced in the mouth on plates caries occurs showing tissue changes absolutely identical with living teeth ; and lastly the fact that caries can be produced in extracted teeth artificially indistinguishable from that which occurs in the mouth.

The method of staining adopted by Mr. Pound was that of Gram, with some modifications. Mr. Sewill would shortly publish a full account of this, as well as of the method of preparing and cutting sections which had been employed.

The PRESIDENT said it would be impossible to conceive anything more perfect than the specimens of Mr. Pringle's photographs which Mr. Sewill had shown, he (the President) had never seen anything so perfect.

Mr. CHARTERS WHITE said that from the way in which Mr. Sewill's communication had been received it was evident that the Society thoroughly appreciated the work he had done, supplemented so ably by Mr. Andrew Pringle, who was *facile princeps* in photo-micrography. In the early days of dental pathology he (Mr. White) was inclined to adopt the view that the origin of caries was sound within, *i.e.*, through a vital and physiological process, for there were one or two points upon which his opinion was based at the time which convinced him that dental caries arose from within, as well as from without, but in later years he had come to Mr. Sewill's conclusion, that caries is due to external agencies in all cases, for if dental caries originated from within, it would very often, if not always, be found that a cavity existed in the dentine, far removed from the external surfaces of the enamel, but that was not the case. Once he thought he had discovered a cavity below the enamel, but on careful examination, he found it originated from a cavity in the enamel itself, which he had overlooked. He thought that the conditions they had seen photographed and shown on the screen, such as granular enamel, subjected the teeth to the attack of micro-organisms; once let such a condition be established on the enamel and the work proceeds by a sort of fermentation in the line of the tissues; the cavity becomes enlarged, micrococci multiply, and as yeast ferments, so they ferment until the dentine is exposed. These views were understood by everyone, so that he did not pretend to be stating anything original, but he had made these remarks rather for the purpose of supporting the opinions of Mr. Sewill, with which he agreed.

Mr. F. J. BENNETT thought that Mr. Sewill's delightful paper had been of the utmost service, not because it contained anything new—indeed, the absence of anything new made discussion, if not impossible, at least unnecessary. But it was a great advantage for them to be able to see, by means of such pictures as Mr. Sewill had been able to obtain by the assistance of Mr. Pound and Pringle, the facts demonstrated upon which the opinions as to the etiology of dental caries rested. Mr. Sewill had so freely acknowledged the sources to which he was indebted in the course of his investigations,

that he felt sure that he (Mr. Sewill) would be glad to be reminded that with the name of Mr. Arthur Underwood, who has done so much, should always be associated the name of Mr. Milles, who had so ably worked in the same field. He felt sure that Mr. Underwood himself would be pained if his name were divorced from that of Mr. W. T. Milles.

Mr. SEWILL, in reply, thanked Mr. Bennett for drawing his attention to the most unintentional omission of Mr. Milles' name in connection with Mr. Underwood's work on dental caries. He added that he hoped to prosecute his research further, and with the assistance of improved methods to arrive at definite results.

The President, having given the usual votes of thanks to the readers of communications, announced that the next meeting would take place on May 5th, when a paper would be read by Mr. J. Howard Mummery on "Some Points in the Preparation of Microscopical Sections of Teeth," illustrated by the lantern; casual communications by Mr. Thomas G. Read on a "Method of Crowning using a Model," and by Mr. Harry Baldwin on a "Case of Hyperostosis of the Upper Jaw."

The Meeting then adjourned.

Dental News.

The number of names on the Dental Register for 1890 is 4818. A decrease of 527 since 1882. The proportion of diplomates to the unqualified is 22.41 p.c., as against 9.30 p.c. in 1882.

A Dental Outpatients' Department in connection with the University of Vienna was opened on April 21st. It is hoped that the new institution, which is under the direction of Dr. Julius Scheff, is the first step towards the establishment of a fully equipped school of dentistry in the Austrian capital.

The *Skandinavisk Tidsskrift for Tandlaeger*, the only dental journal published in the Swedish language, has been discontinued.

There are 486 registered Dentists in Victoria.

The Harvard Dental College recently received a gift of £200 to be added to its endowment fund.

At the concluding meeting of the Royal College of Dental Surgeons of Canada, the diploma of the College conferring the title of L.D.S., was conferred on 32 graduates. Mr. J. P. Marshall, a Licentiate of five year's standing, received the diploma conferring the title of Master of Dental Surgery. Mr. A. Martin was the College Gold Medallist, and Dr. D. A. Black, the College Silver Medallist.

DR. G. SIMS WOODHEAD, the curator of the newly founded "Research Laboratory" of the Royal College of Surgeons, was entertained at dinner, and presented with a collection of plate by his friends in Edinburgh. Dr. Sims Woodhead held a similar position in that city.

AT THE COUNCIL MEETING OF THE COLLEGE OF SURGEONS HELD MAY 8th. The revised synopsis of subjects for the Examination in Chemistry and Clinical Physics was adopted, it will come into operation on and after May 1st, 1891. The President announced that, with the permission of the Council, he proposed to give a conversazione at the College during the summer. The annual meeting of Fellows for the election of Council will be held on July 3rd, at 2 o'clock.

AT THE FIRST AND SECOND MEETINGS OF THE SELECT COMMITTEE ON HOSPITALS, Colonel Montefiore, on behalf of the Charity Organisation Society, Dr. Steele, Medical Superintendent of Guy's, and Mr. Timothy Holmes, Consulting Surgeon of St. George's, were examined. Colonel Montefiore spoke against the crowding of the Out-patient's department by people with but slight ailments and by those who could afford to pay. He thought, but for the numerous gratuitous and part pay institutions the local practitioner's fees would not be driven down as now. He believed the charge at Guy's had

for a time lessened the number of Out-patients, but they were again increasing. New hospitals were, sometimes under very doubtful auspices, established for special diseases, without any consideration to existing similar institutions. Some were started as pure business affairs, and some as speculations. The hospitals were crowded together within an area of about two miles from Charing Cross, and the needs of the poor people in the suburbs were almost entirely neglected. For local purposes, the hospitals and dispensaries were ill grouped. His Society urged that, to avoid the present difficulty arising from the diverse method of keeping accounts, there should be a uniform system; that to increase their responsibility, all medical men attached to hospitals should be paid; that the out-patient cases should be limited in number; that there should be combination between hospitals and dispensaries; and that there should be some central controlling authority over hospitals.

Dr. Steele considered, that the fact that Guy's in its lying-in department, dispensed so much charity, must take away from the work of many small practitioners in the neighbourhood. A medical school of a hospital must do that, to some extent, for the instruction of the pupils. Most of the large general hospitals now had special departments, where patients could be equally well treated as in the special hospitals, except perhaps in a few exceptional instances. There was not any necessity for the large majority of the special hospitals. He believed the class which chiefly received the advantages of the treatment at medical charities were the working classes, from the dock labourer to the skilled mechanic. Guy's had to pay about £1,500 a year in rates for the support of the sick, poor and that was considered most inequitable, for about one-third of the patients came from the parish in which the hospital was situated, and a great saving to the rates was thus effected. He should like to see some system of licensing or registration before any new hospital was established, and it would be well if there was some central controlling authority over the medical charities.

Mr. Timothy Holmes said it would be a hardship to the public if the out-patient system were entirely abolished. He would like to see it a consultative department as in France. One half of the special hospitals could be closed, to the great benefit of the public who subscribe to charities. The accommodation in the general hospitals would be sufficient to treat patients suffering from special diseases even if a large number

of special hospitals were closed. He should be very sorry to see the medical charities placed under State management. Great advantage might be taken of the infirmaries for the purpose of medical education. There were no facilities in London for medical students to study infectious diseases.

THE BERLIN CONGRESS.—A special committee has been formed which will supply full information as to lodgings, etc. Inquiries should be addressed to the office of the Congress, 19, Karlstrasse, Berlin, N.W., the envelope being marked on the outside "Wohnungsangelegenheit."

The management of the Medico-scientific Exhibition, that is to be held during the Congress, make an appeal to all inventors, etc., to join in making the exhibition a success. It will be grouped under the following heads :

1. New or improved scientific instruments for biological and special medical purposes, including apparatus for photography and spectral analysis pertaining to medicine.
2. New pharmacological chemical substances and preparations.
3. New pharmaceutical substances and preparations.
4. New food preparations.
5. New or improved instruments for internal and external medicine, and allied specialities, including electrotherapy.
6. Plans and models (new) of hospitals, houses for convalescents, disinfection, and general bathhouses.
7. New appliances for nursing the sick, including the methods of transportation and baths for the sick.
8. New sanitary appliances.

The Members of the Committee on Dental Instruments, are Drs. Busch, Miller, and Sauer.

All communications should be addressed to the Office of the Congress.

WE understand that the instructions previously issued to prospective Honorary Officers of XIV. Section, 10th International Medical Congress, which were that their duties would be confined to the sittings of the sections, has been altered practically to "go ahead and get up all the interest you can."

England for her own credit's sake should try to make for lost time. Procure good Papers, Demonstrations and Exhibits. America, we hear, is already to the front.

At present the German Committee has only issued invitations to members of the Odontological Society. Surely there is much real merit outside this one Society that should be heard of. Invidious distinctions would be avoided if invitations were given to all respectable members of the profession, or to all those eligible for membership to any Society of good standing. The Honorary Officers for Great Britain and Ireland are :—*Honorary Presidents*: Howard J. Mummary, M.R.C.S., L.D.S. Eng. ; W. B. Macleod, L.D.S. Edin. A. W. W. Baker, M.D., F.R.C.S.I., L.D.S.I. ; *Hon. Sec.* C. Cunningham, M.A., D.M.D., L.D.S.

PASS LISTS.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At the April sittings of the Examiners, the following gentlemen passed the First Professional Dental Examination :—John Charles Holland, Huddersfield ; Henry Alexander Matheson, Edinburgh ; Robert Nasmyth Hannah, Edinburgh ; Murray Thomson, Edinburgh ; David Wilson, Edinburgh, and Joseph Douglas Stewart Shepherd, Edinburgh ; and the following gentlemen passed the Final Professional Examination and were admitted Licentiates in Dental Surgery :—John William Daniels, Tyldesley near Manchester ; John Wesley Lloyd, Liverpool. and Alexander Wilson, Glasgow.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The following gentlemen having passed the necessary examination have been admitted Licentiates in Dental Surgery of the College :—Mr. S. A. T. (Wisbech), Mr. A. L. Harrington, (Rochford), Mr. H. Hudson (Birmingham), Mr. T. Nottingham (Hull), and Mr. G. A. Story (Canterbury). The next examination will be held on Monday, July 21st.

FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW.—

The following Candidates passed the First Dental Examination at the May sittings of the Examiners :—

Alexander Naismith, Glasgow ; David P. Boyd, Glasgow ; Thomas D. Nicol, Glasgow ; Arthur Sutcliffe, Morningside, Bradford.

The following passed the final examination, and were admitted Licentiates in Dental Surgery :—

Albert E. Anderson, D.D.S., Maidstone ; Charles Hilton,

Brighton ; Ernest S. S. Marshall, London ; Eli Wright, Birmingham ; John Head, Millgate Facit, Rochdale ; James Duncan, Glasgow.

LEGAL.

Partridge v. General Council of Medical Education and Registration.

This is an appeal from the judgment of Mr. Baron Huddleston at the trial of the action. The action was brought for unlawfully and maliciously removing the plaintiff's name from the Dentists' Register kept by the defendants under the Dentists' Act, 1878.

The details of the case are well known. On account of advertising in connection with the South Kensington Dental Institution in July, 1885, the College of Surgeons in Ireland withdrew the plaintiff's diploma, and notified this fact to the General Council of Medical Education and Registration. This latter body, upon the ground that the defendant had lost his qualification, on June 1, 1886, ordered his name to be erased from the Dentists' Register. A *mandamus* was granted by the Court directing the council to restore the plaintiff's name on the ground that they had not held any inquiry and had not acted under sections 13 and 15 of the Dentists' Act, 1878. The plaintiff's name was accordingly restored to the register on September 18, 1887, and the plaintiff brought this action to recover damages for the wrongful erasure of his name during this period. The General Medical Council subsequently held an inquiry under section 15 of the Act, and on November 25, 1887, ordered the plaintiff's name to be removed from the register. The action was tried before Mr. Baron Huddleston without a jury, and he held that the action was not maintainable without evidence of malice, and gave judgment for the defendants.

The Court dismissed the appeal.

The Master of the Rolls said that the case was being tried with a jury, when, for a reason which he could never understand, the case was left to be tried by the judge without the jury. That was equivalent to treating the case as if the jury had never been there, and the question whether or not there was evidence of malice to go to the jury could not arise. The Judge must have found, and must be taken to have found, that there was no malice. No one could possibly suggest any malice. There was, therefore, no malice in fact.

Then how did the defendants fulfil the duty imposed upon them by the statute? He would undertake to inform them how they ought to act when inquiring whether a name should be erased from the register. They ought to make careful inquiry whether there was any ground for doing so, and they ought to communicate with the person against whom any accusation was made and ask for his explanations. He did not go so far as to say that they ought to hear the witnesses, if there were any, in the presence of the accused, but they ought to communicate the evidence to him and ask for his explanations upon it. They ought to do this before deciding to erase a name. It was quite clear that the defendants had not done in this case what they ought to have done, and the Court had granted a *mandamus* to reinsert the plaintiff's name in the register. But it was quite a different question whether an action would lie against the defendants for having acted wrongly. The duties were imposed upon them by the Dentists Act, 1878, and they were intending to act under the Act. Assuming that they were acting under section 13, then, in his opinion, they were acting in a judicial capacity. It was said that they intended to act under section 11, and not under section 13. In his opinion, if they intended to act under the Act, and erroneously acted under the wrong section, they would not be liable if the act was not merely ministerial. But assuming that they acted under section 11, was their act a merely ministerial act? He thought clearly not. In his opinion the giving an order to the registrar under that section was not a merely ministerial act, but depended upon the exercise of their discretion. This proposition seemed to him to be true—that where a public duty was imposed upon persons by statute, and that duty consisted in the exercise of a discretion, the act done in performance of that duty could not be said to be merely ministerial, but must for the purposes of protection be considered as judicial. The protection could only be got rid of by showing that the act was ministerial. The protection, therefore, existed in this case, there being no malice, and the appeal must be dismissed.

Lord Justice Fry and Lord Justice Lopes concurred.

OBITUARY NOTICES.

We regret to announce the death of Mr. George Sleep, at the early age of 32, which took place at his residence in

Kepple Street, Russell Square, on May 4th, under somewhat painful circumstances. Mr. Sleep was a native of Plymouth, where his brother is in practice as a dental surgeon. He came to London about ten years ago, after taking the Irish diploma of L.D.S. Delicate health in the form of chronic bronchitis, accompanied his labours, which of late became more distressing. The painful discovery was made by his page on the morning of the 3rd instant, when on entering his drawing-room, found him sitting in the same position he had occupied the previous evening, lifeless, death having taken place during sleep, the result of heart failure. An inquest has been held when a verdict of death from natural causes was returned by the jury.

We regret to record the death, on the 18th of last month, of Mr. Alfred Hill, L.D.S. Eng., who for many years practised at Henrietta Street, Cavendish Square. Till but a little while before his illness, he was in his usual health, indeed, only five days earlier, a correspondent tells us, he saw him talking, in that bright and cheery manner his friends knew so well, whilst waiting for his morning train on the platform of the Ealing station.

Mr. Hill was suddenly seized with acute symptoms of intestinal obstruction. It was feared there might be some knot or intersusception of the bowel, and with the object of relieving this Mr. Pearce Gould operated. Aid, however, came too late, and in spite of skill and tender care, Mr. Hill died the following day.

Mr. Hill was an energetic worker in many fields, but his chief labour for our profession was in connection with the Reform movement. In 1856, he was elected co-secretary with Mr. Rymer, of the College of Dentists. This onerous post he continued to hold the College was merged into the Odontological Society. He was one of the founders of the Dental Hospital of London, and served this institution in his usual whole-hearted manner for five-and-twenty years as Dental Surgeon, as Teacher, and as Hon. Sec. of the Managing and Medical Committees. Gifted with a ready pen, and knowing, at first hand, all the ins and outs of the Reform movement, none were so qualified to tell its History as Mr. Hill. This task he undertook, and the book, which was published in 1877, will ever remain the record of those eventful years.

Mr. Hill's remains were buried at the Ealing Cemetery,

and many leading members of our Profession followed, including some who have long since ceased to be on the "Active List," old friends and comrades, all anxious to testify by their presence the esteem in which they had held him.

Dental Hospital Reports.

MONTHLY STATEMENT of operations during March 1890.

	Manchester.	Liverpool.
Patients	1092	2245
Extractions	660	1922
" under Anæsthetics	133	80
Gold Fillings	34	41
Other Fillings	257	106
Irregularities	—	—
Miscellaneous	322	—
Artificial Crowns	—	—
Total	1406	2301

House Surgeons

C. H. SMALE.

FIELDEN BRIGGS.
C. P. DOPSON.

BOOKS AND JOURNALS RECEIVED.

Pharmaceutical Journal, Chemist and Druggist, The Lancet, British Medical, Glasgow Medical Journal, Southern Dental Journal, The Dental Review, La Medecine Hypodermique, Transactions of the Odontological Society of Great Britain, L'Odontologie, The Dental Advertiser, Correspondenz Blatt, Medical Bulletin, Dominion Dental Journal, Western Dental Journal, Dental Record, Dental Cosmos, Odontographic Journal.

British Journal of Dental Science.

No. 537. LONDON, JUNE 2, 1890. VOL. XXXIII.

VAGARIES OF A TOOTHPLATE.

BY DR. A. LEDLIE, Belfast.

AN accident connected with dentistry, recently occurred, which, as far as I know, is unprecedented.

Mrs. F., is a young married woman in this city, the mother of four children, the youngest being about four weeks old at the time of the accident.

About eleven years ago, while yet unmarried, she procured, from a local dentist, a toothplate with four artificial teeth, these were to fill the spaces formerly occupied by the two right incisors and the lateral incisor and left canine of the superior maxilla. When the plate was *in situ*, an empty space between the two middle artificial teeth was occupied by the natural left middle incisor; consequently the plate, although carrying four teeth, was a five-tooth plate in size. A sharp-pointed golden hook, not unlike a small fishing-hook *minus* the barbs, projected from each end of the plate, and connected it with the canine on the right side, and with the anterior bicuspid on the left.

About a year ago, this left anterior bicuspid, having become carious, was extracted. The corresponding hook was thus rendered worse than useless, and so, was removed. The remaining hook now became converted into a sort of hinge to the plate. The faithful natural left incisor still remained firm in its place, and acted as a check to the swinging forward of the plate, but the tongue, less stable than the tooth, did not always hinder it from swinging backward.

By-and-by the right canine began to yield to the same morbid process that had already removed its neighbours—a process, no doubt, accelerated by friction with the now moveable band, embracing its neck. The left central incisor also began to show signs of decay. The points of support thus gradually becoming more and more imperfect, so loose and

insecure did the plate ultimately become, that, not infrequently, it was ejected from the mouth by coughing.

From the time when the second hook had to be dispensed with, it was her custom to remove the plate from the mouth, before going to bed. On Thursday night, February 20th, 1890, she foolishly neglected to do so. About 10.30, shortly after falling asleep, she was awakened by a sense of choking, and found she had swallowed the plate and its accompaniments.

I saw her half an hour later. The plate was lodged in the œsophagus, behind the middle bone of the sternum, and was causing very much discomfort. The sensation was no longer that of choking, but rather of great oppression and crushing behind the sternum, which called forth a continuous, but unsuccessful, effort at swallowing. I introduced a probang, which dislodged the plate. It passed on into the stomach, and she experienced immediate relief. I advised that her food should be potatoes, rice, and eggs; that liquids should, as far as possible be avoided, and that no purgatives should be taken. This course was strictly followed.

Next day she complained of some discomfort in the epigastrium, but this soon passed away. The bowels were moved on the Saturday and again on the Sunday. On Monday morning, about 11 o'clock they were again moved. The motion was firm, and, on its being broken, the plate, teeth, and hook were found entire, and completely concealed inside the faecal mass. No ill consequence has followed, and no trouble arose during the passage, except the epigastric discomfort on the second day, and the thirst caused by abstinence from liquids.

It scarcely needs to be said that the part of the composite adventurer, which caused most anxiety, during its excursion down the alimentary canal, was the hook. That such a structure should successfully accomplish such a voyage through such a passage—steer through straits, delay in dilations, swing round convolutions, and ultimately escape into the outer world, without having come to anchor at any point, is well-nigh incredible.

The marvellous avoidance of this most dreaded complication is, probably, not altogether inexplicable. It is almost certain that the hook passed foremost down the œsophagus, thus keeping its convexity in advance, and its point directed slightly upwards. The whole structure, probably passed the pylorus entombed in the solid contents of the stomach, the

wire still maintaining its advanced position. The duodenum once reached, and the vehicle of solid food moulded into cylindrical shape, the remainder of the voyage would be, comparatively, plain sailing. Abstinence from purgatives, and liquids would reduce the peristaltic movement of the bowels to a minimum, and so, would lessen the chance of the cylindrical case becoming disintegrated or altered in shape. The want of liquid, moreover, would greatly diminish solution and digestion, and, to that extent, would preserve the integrity of the mass.

Its progress through the duodenum, jejunum, and ileum, (a tube of nearly even calibre), would be something like the movement of a piston head, down its cylinder. After escaping through the ileo-cæcal valve, the covering of the plate would, probably become deepened by fæcal accretions, and more solid by the absorbent action on the bowels: the calibre of the tube would be much wider, and its course much less tortuous, and, hence, the remainder of the passage, through colon, sigmoid flexure, rectum, and anus, would be accomplished with diminished danger. In short, the passage of the cylindrical mass, from the pylorus to and through the anus, would be practically the same as it would have been had it not contained the dental appliance at all.

While it is highly probable that the foregoing is a substantially correct solution of the successful termination of this hazardous adventure. It is highly improbable that the same little piece of oral furniture could repeat the same feat with results equally harmless, and it would be interesting to know if any reader of the *Journal* can point to a similar case, published or unpublished.



The accompanying engraving is an admirable representation of the plate and its attachments. The block was kindly lent by the Editor of the *British Medical Journal*, in which I published a brief account of the case, last month.

THE ANGLE SYSTEM OF TREATING FRACTURES OF THE MAXILLARY BONES.

By EDMUND H. ANGLE,

Professor of Histology, Comparative Anatomy and Orthodontia in the State University of Minnesota.

MUSCULAR contraction is a most difficult obstacle to overcome in reducing and maintaining in proper apposition most fractured bones. Especially in the case of femur and patella is this force so great, so constant, and so difficult to antagonize, that probably the ideal or normal result is never attained.

In fractures of the inferior maxilla it is equally a most serious hindrance in the way of obtaining a union of the parts, and should always be carefully considered in the construction of an appliance for this purpose. Indeed, this obstacle, taken in connection with the large number of movements to which the human jaw is susceptible, and the great number of causes which contribute to the production of these movements, renders this the most difficult bone in the entire human frame to maintain in perfect apposition during the healing process.

This fact is well evinced by the innumerable devices and appliances which have been recommended for the purpose. The methods I have adopted in treating fractures of this bone have been so successful and the results so gratifying, that they seem to approach, in efficiency and simplicity, more nearly to the ideal than anything yet devised.

In order that this system of treating fractures of the maxillary bones may be more easily understood, I will divide these inquiries into three classes.

The first class comprises all simple fractures in which the teeth are good, and sufficiently sound and firm in their attachments, (especially on each side of the fracture), to afford good anchorage for the appliance which shall support the fracture.

The second class comprises all fractures where the teeth are unsuited, by disease or any other cause, for anchorage, but are sufficient to give correct articulation of the jaws, when they are in proper adjustment.

The third class comprises all fractures of jaws which are edentulous. The following cases, treated by myself, will enable the reader to comprehend the method peculiar to each class.

Case 1 will illustrate class one. May 29, 1889, Nels Parsons, aged 21, was admitted to the St. Anthony Hospital of this city. He had fallen from a pile of lumber, a distance of 15 or 20 feet, and besides several bruises, suffered a simple fracture through the symphysis, terminating, however, in front between the Central and Lateral on the left side, as shown by the line in the engraving (Fig. 1). Upon examination, I

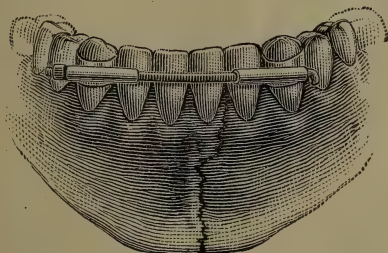


Fig. 1. ANCHOR SPLINT.

found that the fractured bone was quite widely separated at the top, and that the left central incisor was loosened. The following treatment was practised.

First, the ends of the fractured bones were placed in their proper position, and temporarily fastened by lacing the teeth with silk ligatures.

Second, Bands of very thin German silver were made to encircle and accurately fit the cuspid teeth. A small tube of German silver, $\frac{1}{2}$ inch in length, was soldered to each band, and in exact alignment, a piece of wire accurately fitting the bore of these tubes, bent at right angles at one end, and having a screw cut upon the other end, was slipped through each tube, and secured therein by adjusting a nut on the screw. The bands were cemented in position upon the teeth by means of oxy-phosphate cement, as shown in Fig. 1. After the cement had become thoroughly set, the nut was then tightened until the fractured ends of the bone were drawn tightly together.

These bands, tubes, wires, screws, and nuts are some of the appliances known as "Angle's Regulating and Retaining Appliances," devised and used for the purpose of correcting irregularities of the teeth, as shown in Fig. 2. They may be

made by any ingenious dentist, or procured from any dealer in dental goods.

The appliance was worn without displacement or trouble for 21 days, when it was removed, the bone having become firmly united. I may add, that during the time the appliance was worn, so firmly was the jaw supported, that the patient suffered little, if any, inconvenience, and after the third day, partook regularly of his meals, using his jaw freely, and only avoiding the hardest particles of food. After removing the appliance a careful impression of the jaw was taken, a model made, the appliance transferred to the model, exactly as shown in the engraving. The lower part of the jaw is, of course, diagrammatic, as added by my engraver, to show the line of fracture.

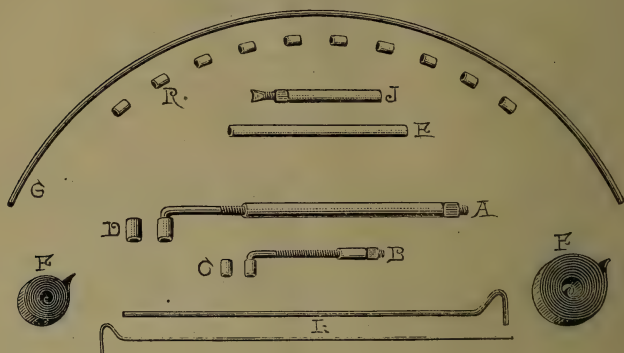


Fig. 2.

It should be borne in mind, that the principle upon which this appliance is based, is not the same as that which is operative when the teeth are simply wired together, it is very different. For, in wiring, the upper part of the fracture only is tipped, or drawn together, and no pressure or support is given to the lower part; while in the principle applied here, it will be seen that, because the bands and pipes are rigidly attached to the anchor teeth, tipping is impossible, and pressure is exerted equally upon both parts (upper and lower), of the fracture, as they are drawn together by the screw: or, as my friend Dr. Charles G. Brown (who first suggested to me this use of the screw,) puts it, "It is a Malgaigne Splint, if you please, except that the hooks are not foreign bodies." This

device may be applied in any locality in either jaw, provided suitable teeth for anchorage be not remote from the line of fracture. The screw may be bent to accommodate the curve in the jaw should the fracture occur in the region of the cuspid.

CASE 2.

The method applied to cases of the second class may be understood from the treatment in the following instance : On July the 4th, 1889, William Fraley, aged 45, was admitted to the Minneapolis City Hospital. A blow from a policeman's club had produced two simple fractures of the inferior maxilla. The first was an oblique fracture of the right side, beginning with the socket of the second bicuspid, extending downward and backward, involving the socket of the first molar, breaking out the second bicuspid and greatly loosening the first molar. The second molar had been lost years before, while the third, as well as the remaining teeth, were much abraded and loosened by salivary calculus, thus making the application of the appliance described in case No. 1 impossible. The second fracture was situated on the opposite side high up in ramus. Because of the swollen condition of the parts, I could not detect the exact line of cleavage, but the grinding of the ends of the bone and the great pain occasioned thereby were unmistakable evidences of a fracture. The patient, as in all such cases, was unable to close the jaws. The fracture on the right side was widely separated and the anterior piece was much depressed by reason of the contraction of the digastric muscle, while the posterior piece of bone was drawn firmly up, the molar occluding. The following treatment was used. Bands were made to encircle all four of the cuspid teeth, they being the most firmly attached in their sockets. The fractured ends of the bones were placed in careful apposition, the lower jaw was closed carefully, the lower teeth upon the upper, and requiring so great force and occasioning so much pain, that the use of an anæsthetic became necessary. Points on the bands required for the necessary attachments were carefully noted. The bands were then slipped off from the teeth, and little pipes (shown at C. Fig. 2) soldered at the marked points on the band, after which the bands were cemented in their proper positions upon the teeth, and two small traction screw wires, the same as shown at B. Fig. 2, were slipped into the pipes. The jaws were closed and the nuts tightened on the screws, until the jaws were drawn firmly together, and each tooth occupied its exact normal position

in occluding with its fellow of the opposite jaw. Both fractures were then carefully examined, and found to be in perfect apposition, and presented the appearance shown in Fig. 3. How could it be otherwise? for the most natural position for the jaw and the muscles involved had been secured, and all were in their natural place of relaxation and rest.

During an attack of coughing, in the night following, one of the hands was wrenched loose, but was replaced the next day without trouble. No further accidents occurred. The patient readily took nourishment through the spaces between the teeth. Thus the fractured jaw was firmly supported without the least motion for 22 days, when the appliance was removed, showing most excellent results.

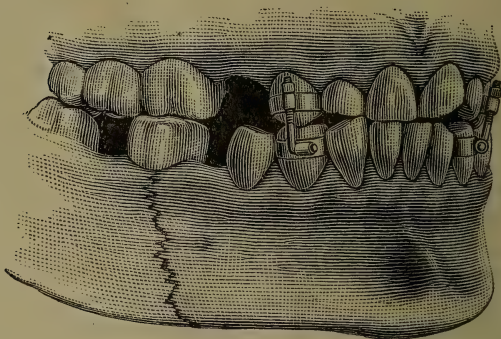


Fig. 3.

That the patient was a great lover of the clay pipe, was shown by the much worn condition of the lateral incisors, which had resulted from holding the stem of the pipe. While wearing the appliance he was not deprived of his favourite comfort, but was compelled to grasp the stem between the lips instead of the teeth.

CASE 3.

The following case possesses several points of special interest, although the fractures occurred in regions similar to the case just described, because the appliances, although involving similar mechanical principles will be found to be greatly simplified.

Dec. 28, Thomas Brennan was admitted to the Dental Infirmary of the State University of Minnesota, suffering

from the effects of a blow received on the left side of the jaw, from a cant hook, while working in the lumber camps of Wisconsin, which had produced fracture of the jaw in two places. The first was on the left side beginning between the first and second bicuspid and extended downward and backwards so far as to involve the lower part of the anterior root of the first molar. The second was on the right side directly through the angle of the jaw. The fractures had occurred 32 days previous to his admission to the infirmary, during which time nothing had been done to reduce them. He reported, that he had called upon a physician, who supposed the trouble was merely an abscessed tooth, and had lanced the gum with the view of reducing the swelling. Later the patient had called upon a dentist in one of the smaller towns, who also failed to diagnose the fractures, and extracted both bicuspid in the hope of giving relief.

Upon examination I found considerable swelling in the region of these fractures, with the usual result; the patient being unable to close his mouth by reason of the fact that the anterior piece of the fractured bone was drawn down by the contraction of the depressor muscles. A false joint had also been established. The bones could be easily worked without causing pain.

At the point of fracture of the right side there was little or no displacement; the swelling was also slight. With the assistance of Prof. Leonard the patient was anæsthetized; the ends of the bones were then rubbed forcibly together with the view of breaking up the false attachments and stimulating activity in repair.

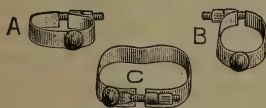


Fig. 4.—ANGLE'S FRACTURE

The ends of the bones were now placed in perfect apposition and the jaw closed, taking great care to articulate the teeth in their correct position against the upper ones.

The jaw was now firmly bound in this position to the upper teeth in the same manner described in Case No. 2, only that the method was improved upon by using *clasp bands* as shown in Fig. 4.

No cement was necessary, and instead of the screws small metallic buttons were soldered to the side of these bands, (as shown in the cut) around which was wrapped in the form of a figure eight fine binding wires as shown in Fig. 5.

Four bands were used encircling the four cuspid teeth. Those bands, shown upon the molar teeth in the engraving, were not used, but are so displayed for the purpose of illustrating their use in cases which might demand their employment. At the end of 17 days the bands were removed and the patient discharged, the bone having been firmly united.

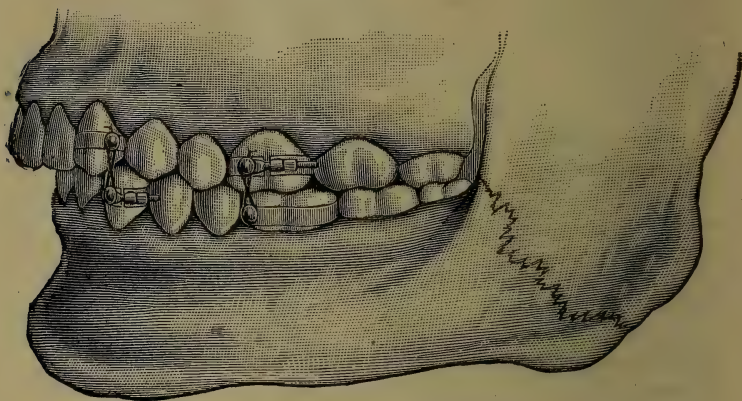


Fig. 5.

It might be urged as an argument against this method that the teeth being closed and the jaws being firmly bound together, the patient would be unable to take sufficient nourishment. This however is untrue, for it rarely happens that a patient is found without some teeth missing, thereby leaving abundance of space for the passage of the liquid foods, and even if all the teeth were sound and in perfect position, it has been proved that there is plenty of space between the teeth and behind the molars and between the upper and lower incisors for taking all necessary nourishment. Of course in such rare cases much more time would be required in taking food, but this obstacle is so greatly compensated for by the main points of advantage in its favour, such as (1) cleanliness, (2) comfort to the patient, as compared with many other bulky and awkward appliances. (3), Its extreme simplicity, enab-

ing any one, with ordinary mechanical ability, when provided with a set of clamp bands, to easily and quickly set all ordinary cases of fracture. (4), And last, the certainty of correct results. These will, I think, be sufficient reasons for all those who are interested in this branch of surgery to give the method a trial.

Cases coming under Class No. 3, comprising fractures of edentulous jaws, are fortunately very rare. The method of treatment I propose in such cases is similar in principal to that already discovered in Class No. 1, only in place of the teeth, small bone hooks are used, a suitable cavity for their reception being drilled on each side of the fracture coincident in position with the original sockets of the teeth as if the implantation of teeth were intended; save that the cavities thus made need not be nearly so large or so deep. They should also be drilled obliquely to correspond to the course taken by the hooks. The hooks before insertion should of course be made antiseptic.

IMPORTANT LITTLE THINGS IN DENTISTRY.

By J. R. BELL, D.D.S., Cleveland, O.

I BELIEVE there is no calling whatsoever, made up of such an infinitesimal number of small things as our profession, any one of which if left out or forgotten proves more or less disastrous.

Naturally from force of circumstances we are made to devise, improve, invent, borrow, and sometimes steal ideas by which we may more perfectly accomplish our aims. There is a saying that is almost a proverb, viz., "A man is a fool who does not know when he has enough." This may apply to some men, but to the true dentist, never. Here a little, and there a little, gleaned from free intercourse are many times like the crude stone, rough and unfinished, but after a change of hands are made shapely and a fixed gem for all time. So with our rough thoughts enlarged upon, viewed by other minds become transposed into greater usefulness. And thus it is with an improved device or method, be it ever so

simple or used only semi-occasionally, it is invaluable if it is an improvement, and should be made known to the profession, for it is by seeing objects differently that progress is made, and often reverts good to the original inventor.

I fully realize my inability to do justice to the subject chosen in the short space allotted. I will not attempt to classify, but will give what may or may not be new or interesting.

I am encouraged in a simple though effectual method, thus far, of operating upon the gums to produce a union between the same and the periosteum on the tooth after treating the gums, when the pathological conditions are favourable, and this is especially necessary in any case. It consists in guaging the gum margin 1-16th of an inch from the free edge with a sharp scalpel, cutting one line deep where there is thickness to admit of it; the lance being carried at an angle of 45 degrees from the axis of the teeth and from left to right of the mouth, but never be allowed to extend through; should that occur our object would be lost.

The above treatment, according to my little experience, accomplishes a long-felt want in crimping the loose margins around the teeth, and by producing acute inflammation and naturally expansion of the soft tissue at the desired point. Thus closing up the mouth of the diseased parts irritating secretions are excluded. Before this final operation, however, after dressing the pockets with proper medicaments, the application of a small amount of tannic acid and glycerine to the mouth of the pocket only, I think advantageous, as it puckers the mouth of the pocket. I hope to be able to give a more detailed account of my theory, symptoms, and treatment, later.

Tannic acid and glycerine is effectual, applied to cavity sockets. Where there is excessive hemorrhage, or in case an immediate impression is necessary, but where a packing is required to check the flow of blood, in emergency a pellet of cotton, of suitable size, saturated with a thin solution of gutta-percha and chloroform is sure, but should be removed within twenty-four hours; otherwise it will become engrafted to the walls. A suitable pellet of cotton saturated with a thicker solution of the same makes a simple and effectual temporary plug for tooth cavities, previously drying the cavity, for it adheres to the walls, excludes the moisture, retaining cobalt or arsenic safely.

The same packed in the bifurcation of molars before ad-

justing, the rubber cloth will admit of perfect adaptation, which otherwise would not.

Another use can be made of a gutta-percha pellet of cotton, and that is as a stopple in the rubber-dam, in case of accident or imperfection.

My wonder has been how others accomplish their object with but one spatula, so-called, and that used only for mixing cements; in practice a graduated set of these instruments are indispensable, the blades varying in size from $\frac{3}{8}$ to $\frac{1}{4}$ inch, and from 27 to 30 American gauge in thickness; length of blade $1\frac{1}{2}$ to 2 inches. The tempers should be drawn before shaping the blade and only retempered by the heat produced in finishing, thus they are left flexible. I make use of these plain, simple tools as matrices in plastic facings, holding them often where there is no posterior tooth to sustain a regular matrix, or where a band would be impracticable. In exposing cavities to view, pressing the margin of the gum back, and if bright they serve as a reflector where the mirror cannot. Inserting oblong pellets between the teeth to produce space for filling, adjusting ligature above margin edge, etc. If an amalgam filling has to be employed, I do not presume any one here ever uses it, Welch's No. 2 is by far the most satisfactory, it has a toughness of marginal edge, remains more perfectly adapted, finishes smooth and brighter and remains so. The final finish of any amalgam will be enhanced by the use of French crocus No. 0 paper strips for approximal surfaces, and cotton pellets or felt points for crowns and buccal ones. This, however, should not be final, but amalgam filling should be seen twenty-four hours after insertion or later, approximate surfaces polished with No. 00 emery strips, large fillings stoned, and fissures reduced with burs of proper size to a defined edge.

Five drops of the oil of bergamot to the ounce of lubricating oil disguises it, making it pleasant rather than otherwise to sensitive persons. Sanitas oil may be disguised with the same or some other essential oil.

Half grain of coffee grounds, either steeped or fresh, in the vulcanizer, destroys the sulphurous smell so disagreeable, if there is a slight leak where the operating room and laboratory communicate. Coffee grounds burned in the laboratory are a good deodorent in case of necessity.

I might continue these simple ideas indefinitely, but will defer them, for fear of taxing your patience.

British Journal of Dental Science.

LONDON, JUNE 2nd, 1890.

SUCCESS AND FAILURE.

WHY one man succeeds and another does not is a question often asked, though never answered. In every calling in life, the prime factor in determining the success or otherwise of a man's career, is probably the gift of perseverance, combined with tact and the power of impressing other people with a belief in one's skill, etc., a group of qualities usually referred to as a man's "Personal Equation." They are, however, all so vague that any man may imagine he has or has not these attributes, according to his fancy, without much regard for the actual facts of the case. Still, their possession would indicate a mind and character, which, if valuable in one calling more than another, are certainly so in that group, which we are wont to call the Professions, and probably, in none of these so much as in our own. None are brought in such direct contact with our fellow-men and women, as those practising one or other of the many branches of Medicine. In place of a sculptor's clay, which he may model as he will, these have to work upon the human body. They must imbue their patients with a sense of their own power and knowledge. These must regard their word as law, even though that may be ordered which is distasteful, or that done which is painful.

But these attributes would almost seem to be born not made, so that, even though we admit the answer to our question is found in these possessions; it does not advance us, who probably are born without them, in finding a solution to our difficulty. Yet a study of this question is

not without its humourous side. Mixing with another man's patients, one is often struck by their implicit belief in his eminence. One is usually told, that he is at the very top of the tree—a kind of Atlas supporting the whole Dental world on his shoulders. One is asked to admire his skill, or may be one's own opinion is sought,—the evidently expected answer not being always so easy honestly to give.—If, seeking further, one endeavours to find how this practitioner has won this implicit confidence, the answer to our question becomes still more involved. Settle that firmness combined with some brusqueness of manner is the reason, and you are confronted with an equally successful man of the “soapy” order, whose sympathetic feelings almost seem to distil into tears. Admit that it is a painstaking humility, and the noise of some man “blowing his own trumpet” will quickly drown the notion. Suggest that it is thoroughness and good work, and one of the G. P. and Mastic school will assure you he has double the practice. Grant that the possession of the feelings and behaviour of a gentleman are needed, and the patient informs you, the man has none of these things. Indeed, we might almost go on *ad infinitum*, but after all, a man is not likely to raise himself in his own estimation or in that of his friends if he simply plays with the cardinal virtues as if they were cards, and he playing a game of chance. The fact is a man does good work not because of what his patient will think,—the patient is usually sublimely unconscious what is being done,—but because he takes pride in his work, it is to him an Art of which he would be the greatest master. If this is not so, if his idea is simply to make money, doing his work in the easiest and quickest manner, without regard to its being right or wrong, we say, it would have been better if this daubster had not entered the Dental profession.

RUSSIAN women who become doctors are compelled to submit to very stringent regulations. Among other things they may not practise as regular physicians until they are forty, but must up to this time be nurses in charitable institutions of various kinds, or in hospitals.

IN the various provinces which go to make up the Dominion of Canada, the regulations governing the practice of Dentistry are very various. Ontario, Quebec, and British Columbia have very good Dental laws. New Brunswick and Nova Scotia are moving. But, according to Mr. J. S. Bag-nall, in the *Dominion Dental Journal*, Prince Edward's Island is in a very backward condition. There are seven dentists to 120,000 people. Any young man, who has spent a few weeks in an office, has, legally, as much right to practise as the Doctor or Licentiate of Dental Surgery. The click of the electric mallet has never been heard. The principal inducements offered, are cheaper work in one office than another, some special kind of gas, rubber or other material used, and some wonderful office secret.

The Evening News seems to have been interesting itself in Dental matters of late. It tells a curious story of a dentist, who charged the President of one of the smaller American Republics £2000 for putting in a small denture for his wife and for doing some work for his daughters, requiring constant visits for a couple of weeks. He of course expostulated, but the dentist was firm, and at last took legal proceedings. Madame la President was summoned to appear as a witness, but she being a proud and very handsome woman, rather than face a crowded court, preferred to pay the bill. Will our contemporary vouch for all these details? But any way, when telling a story it is no use sticking at trifles, and £2000 certainly reads well. We have ourselves heard a man boast of charging over a hundred guineas for a set. The British Public is an animal full of fads and crazes, and if it chooses to run to a man simply because he happens to be "all the rage," rather than to regular honourable practitioners, it should, at least, not object to "pay the piper."

IN our last issue we noticed, briefly, the opening of a Dental Out-patients' Department in connection with the

University of Vienna ; further details are now to hand, in the "Vierteljahrsschrift für Zahnheilkunde." At present the premises consist of a second floor, comprising a waiting, an attendant's, and three operating rooms. The larger of these last is reserved for extractions, and will also be used for lectures. In the other two rooms are six oil-pump chairs, with bracket tables, engines, gas reflectors, and a complete set of instruments chiefly of S. S. White's manufacture. So far the authorities have been unable to make any provision for mechanical work, but it is hoped to do so at an early date.

HUNGARY is not behind her sister kingdom, and at Budapest University a Dental Department has also been organised, indeed, it is on somewhat a larger scale than that at Vienna. There are two extracting rooms, one of which also serves as lecture room, the other is reserved for operations under anæsthetics. There is a small laboratory, and three rooms for the practice of conservative dentistry ; only one of these, is, so far, fitted up. This, however, is the largest, and contains ten chairs, each of these being furnished with an instrument table, and a complete set of instruments, besides, an arrangement for providing hot water, rubber dam, clamps, a gas lamp on a moveable arm, with conical reflectors, etc., etc. There are five engines available for general use. The Department is under Dr. Josef Arkövy, with Dr. J. Hattyasy as assistant. The curriculum is arranged to meet two wants. 1st, to give the necessary instruction to those doctors who are going into general practice ; and 2nd, to those who are going to devote themselves to the practice of our specialty. It is worthy of note that these latter will not be admitted to the examination for the Dental Diploma till they possess the medical qualification.

CONTRASTING the elaborate outfits that are here provided with the state of things indicated by the clause we know

so well at home, "When permitted to undertake operations for filling teeth, he (the student) must provide the instruments for the same." We are reminded of the remark of an eminent skin specialist, when the hospital authorities refused his request for baths, to treat cases by constant immersion. "Vienna being one of the poorer cities, nothing is too expensive if needed; London being the richest, everything is too expensive." There are certainly some things to be said for, as well as against, the State Aid System for Hospitals. With no call for an outfit, no constant demand on the purse for replacing instruments broken, lost or borrowed (with or without the owner's consent) the students at Buda-Pest certainly have a halcyon time of it.

CURIOUS and wonderful are the ways of London. Thousands, nay millions of pounds are spent in "improvements," and then the whole effect, at any rate in an artistic sense, is spoilt by some glaring anomaly. An instance of this has just come under our notice, where a really marked improvement has been neutralised by a hideous advertisement over the whole front of one of the most prominent buildings. Even the kindly shades of night do not hide it, for it is then illuminated in the most glaring manner. We should of course not refer to it here, but we regret to say, that the subject of this latest atrocity is a tooth-powder.

To most of us Warburg has been simply the name for a Tincture, but it is now invested with an individuality. Dr. Warburg, the inventor, is eighty-six years of age and in dire distress. Yet he might have made a fortune out of this mixture if he had chosen to patent it. But with large-hearted generosity he gave it freely to the Profession. Ought not the Profession, therefore, to make a little return, now it is so needed? The Hon. Sydney Holland, 44, Bryanston Square, is receiving subscriptions on his behalf and if even only those, whose lives have been, humanly speaking, saved by this valuable preparation, would render help, the old man would not at any rate go down to the grave in want.

WE are heartily glad to see from a note in *L'Art Dentaire* that M. de Freycinet has just inaugurated a new step in giving an official status to dentistry in the French army. Students of the Dental Schools, who have obtained their diplomas, are to be attached to the Military hospitals at the principal centres of the Army Corps. When referring to the report of a Dental hospital, a morning paper asked very pertinently what might have happened if Wellington had had the toothache at Waterloo? and we may ask the same question concerning the ordinary rank and file of the army. We do not wish to over-estimate the value of a tooth, but if any one has an aching tooth (and who hasn't at one time or another?) he will realize that it is an effectual hindrance to the proper performance of one's duties. Is it not time, then, that our soldiers should have the benefit of Dental Surgery?

THIS is an advertisement from a contemporary. Can any one tell us what it means? Can a company be a registered dentist?—"American and English Artificial Teeth Supply Company, Limited. Registered by ———— with a capital of £1000 in £1 shares. Objects: To acquire the business of ———— dentists."

BOYCOTTING THE PATENTS :—In connection with the patent question as it affects our own speciality, the following which appears in the *Chemist and Druggist* is interesting reading. "An order has been issued to the pharmacists of Hamburg reminding them that the recommendation of patent medicines is strictly prohibited. Any chemist mentioned in the daily papers as supplying such a preparation will be proceeded against. The official definition of a patent medicine is interesting; it is to the effect that a patent medicine is any mixed medicament which contains an ingredient not in the Pharmacopœia or which is not officially or generally recognised." Surely if it is wrong to hold a patent for a medical drug it is wrong to hold one for a surgical appliance and still more for a method of operating.

Practical Hints

FOR THE SURGERY AND WORKROOM,
AND
MATERIA MEDICA NOTES.

The Editor will be glad to receive paragraphs for insertion under this heading.

HOW TO MAKE A VULCANITE SPLINT IN TWO HOURS :—

A very important consideration, when treating dislocations of the teeth caused by a blow or similar accident, is to introduce a splint in as short a time as possible. The following device, kindly sent us by Mr. David Hepburn, will therefore be welcomed, for by it a vulcanite splint can be made in two hours. The method may, of course, be applied to the making of regulation plates, but there is usually no such hurry, for these. After replacing the tooth, if need be fixing it in place by a ligature, take an impression in wax. If composition be used this must be removed whilst still soft. Cast the model directly in the lower part of flask. Remove wax by dry heat as it is a most important point to have the model warm and dry. Cut the pattern of required plate in lead. Duplicate this in rubber. Warm and dry model, paint over it a solution of Vulcanite in chloroform and then press on it the above rubber plate, making one side adhere first before doubling it over the teeth. If the plate needs to be thicker than this one layer of rubber, pack small pieces on to this. Trim the edges with a warm knife and seal them to model with the solution. Place the upper part of flask over this, fill up with plaster, then fasten and place in the Vulcanizer, which may have been previously warmed. Vulcanize for 1 hour at 320°. Cool rapidly, remove, file, polish. The splint is ready for placing in position.

AN EXCELLENT SAND-BENCH can be made out of an ordinary washing tub. All that is wanted is some stand to place it on, and a piece of board to put across it, resting this on its sides. This forms a table on which the sand can be worked

and the moulds stood for pouring, any superfluous sand being thrown into the tub below.

GUTTA-PERCHA POINTS have lately come largely into use as a root-filling, and certainly with very excellent results. One of the best ways of working these, is to make a solution of gutta-percha in chloroform, and after thoroughly drying out the root canals, work a little of this solution into these, by means of a few fibres of wool round a broach. Now, take the points and introduce these, simply passing them up the root as they are, finish off with a warmed instrument.

A STRONG BASE-PLATE MATERIAL for use in setting up sets to try in, can be made by soaking "Paper Fibre Lint" in Stearine just at the melting point. It is important not to have the Stearine too hot, as otherwise too much of the fat runs out of the paper when it is taken out to cool. This should be cut to the required size, warmed and pressed on the model, and then the teeth fixed to this by wax.

AFTER WORKING WITH PLASTER it is often very difficult to get the hands free of it and into a pleasant state. A teaspoonful or so of moist brown sugar rubbed well on to the hands, while they are wet, accomplishes this very quickly.

THE USE OF SACCHARIN AS A FLAVOURING AGENT for washes and other preparations for the mouth, is advocated by Dr. Heinrich Paschkis. The idea is not new to us, but is decidedly good. Many people like these preparations to have a sweet flavour, and sugar is, at any rate, contra-indicated on account of its so readily undergoing fermentation and forming so excellent a pasturage for germs. Not only does Saccharin not decompose, but it is actually antiseptic. Paschkis found that solutions of Peptones, plus 0.05 p.c. of Saccharin had, after many weeks, undergone no decomposition. Only a very weak solution of Saccharin is required, 0.5 to 0.1 being more than sufficient.

FILLING PULP-CANALS WITH PLASTER-OF-PARIS AND CARBOLIC ACID. Herr Mehl's method.—Mix a few drops of warm water and a drop of carbolic acid (20-30 p.c. solution) with a little Plaster-of-Paris, so as to make a very thin mixture. Cleanse and dry the Pulp chamber, then drop in the above mixture, working it up the root with a little cotton wool. After fifteen minutes the plaster can be trimmed and soft filling inserted. If gold is desired it is best to insert a Temporary G.P. and leave till another sitting. Warm water is used to hasten the setting, and, if desired, Corrosive Sublimate (1 in 500) may be used instead of the Carbolic Acid. Herr Mehl claims that this is easy of introduction, it makes a hard basis for the superjacent filling, it is aseptic, and on account of the porosity of the Plaster and its power of readily soaking up moisture, it would probably absorb any remains of Pulp, which it may have been impossible to remove. He states that he has in 1000 cases never had to remove the tooth though he has occasionally had to apply Iodine.

Before setting crowns, wipe the gums around the root with a solution of per-chloride of iron which will prevent weeping, and the most important part of the cement will be protected till crystallized.—*Dr. L. E. Custer.*

IN filling teeth or roots of teeth in which the walls have been punctured either with a drill or from decay, take a piece of pure gold rolled very thin, form it in the shape of a small cone the size of the canal to be filled. Push it, small end first, as far up the canal as you can, then with a smooth tapering instrument burnish carefully against the walls, after which fill with cement, packing it in very hard, so as to force the sheet of gold against the walls, making a close adaptation. Roots which are so badly decayed as to have several openings in the sides can be filled in this way with perfect success.

ARECA-NUT TOOTH PASTE :

Precipitated chalk	6 oz.
Powdered areca nut	1½
„ cuttlefish bone	½ „
Honey.....	2 „
Glycerine	½ „
Oil of Lavender	10 drops
„	6 „
Otto of rose	3 „
Water	a sufficiency
Make a paste.	<i>Chem. and Drug.</i>

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

Mr. Sly, of Rathbone Place sends us a clipper, for impressing the name and address on gold and platinum plates, which he has made to the design of Mr. Lawrence. It resembles a magnified pair of plate bending pliers one beak of which is provided with a die, the other with a counter-part. Those who wish to impress their name etc. on artificial dentures, may find it useful.

Abstracts of British & Foreign Journals.

DENTAL COSMOS.

THE JAWS AND TEETH OF CAVE-AND-CLIFF-DWELLERS.

BY EUGENE S. TALBOT, M.D., D.D.S., Chicago, Ill.

THE cave-and-cliff dwellers have interested me for a number of years because they are supposed to be the remnant of an ancient race, I visited them while they were in Chicago. Three of the eleven persons in the company are cliff-dwellers, the rest half-breeds. The habits of the former may safely be assumed to have been the same for centuries. Civilisation has not affected their jaws and teeth, and for this reason they are a study to the etiologist.

I found them in a bare room of a dilapidated building, huddled round an old rusty stove, and peacefully smoking cigarettes, all excepting one squatted on the floor, as is their custom. In one corner a few rags were seen on the floor serving as a bed, in the other was a dirty mattress. Their provisions, wrapped in brown paper, were thrown along the wall, on which a solitary bow and arrow were hung.

From a letter published in the newspapers and the lectures of Lieutenant Schwatka, I learned the history of these people, and the gentlemen who has them in charge gave me such other points as I desired to know.

The Yarahumari tribe of Indians occupy a territory in the south-western part of the State of Chinuahua, in the republic of Mexico. This territory is an irregular oval on its boundaries,—the long axis being about one hundred and fifty miles, the short diameter about fifty miles. There are about four or five thousand Yarahumaris in this district, of whom a large number live on the plains, and show, in the manner of living and habits, the evidences of contact with civilization. The remainder live in curious cave or cliff-dwellings among the precipitous mountains which cover their territory. Lieutenant Schwatka brought eleven of them North, of which eight are semi-civilised and three are veritable cliff-dwellers. These three are the most interesting members of the party. They comprise a man, his wife, and child. They came from a cliff-dwelling about twenty-five miles from Yoquiro, a little

village sixty miles southwest of Batopilas. The men of the party are medium-sized, of slender build. In colour they are a rich brown. They have round but well-shaped heads, with long, bushy, straight, coarse, black hair, curving at the ends, somewhat prominent cheek-bones, broad faces. They have large, but well-shaped mouths; their eyes are large, brilliant, with gentle, pleasing expression. Their bodies are well-formed and graceful. They are inured to hardships, and are able to stand extremes of temperature with little inconvenience, notwithstanding their scanty clothing.

The bow, the only weapon of the cave-and-cliff-dwellers, is about four feet long, of "moro" wood, with a twisted deer-hide string. The arrows, about two and a half feet long, are of light cane, the tip being round or triangular, of an excessively hard, fine-grained wood, called uiloche. These tips are about eight inches long. They are very expert with this weapon, and kill deer, wild turkey, and great hawk, whose feathers are used to feather their arrows. Their dwellings are of two kinds,—cave and cliff dwellings,—the distinction being that of location. All live in caves, but some choose caves opening upon the level, while the cliff-dwellers select caves high up the precipitous cliffs of the great canons. These caves are usually single, large apartments with semi-circular mouths. These the cliff-dweller walls up with rude masonry nearly to the top, leaving a space for ventilation and the escape of smoke. An opening for a door is also left. Rarely they erect rude stone buildings inside of the cave-mouth. These caves are reached by long-notched pine-trunks, like the rude ladders used in mines. The furniture is simple; a goat or deerskin or the bare ground for a bed, a few baked pottery dishes made by the women, a fire of pine knots; that is all. A single family lives in each cave, but several generations of one family usually live together in the single apartment. They are monogamous, and seem to be chaste. They have a rude government of their own not well understood. They punish crimes committed by and among themselves, the Mexican government interfering only when one of the parties involved is a Mexican citizen. They are a quiet, peaceful, simple race, very shy and wild, fleeing away at the approach of a stranger. They live by cultivating corn and by the chase. Corn is their staple food, and is used in many ways. Occasionally they make tortillas, but the usual form of using corn is in "pinole" or "atole." "Pinole" is dry corn ground to a very fine meal. This is taken either by throwing

dry dust into the mouth and washing it down with water, or by mixing it with water and drinking it. This latter is the more usual method. "Atole" is the soft corn crushed in water. Venison is broiled on the coals or baked in hot ashes. There are plenty of bears in the mountains, but these they never attack, whether from fear or religious superstition is not known. From corn they manufacture a sort of beer, by dampening the corn until it sprouts, then slightly parching it, then making a mash with water. When the right stage of fermentation is reached it is drunk, as they have no means of arresting the fermentation. To get the intoxicating effect, they fast two or three days, then drink it in large quantities. They obtain small fish by damming up mountain streams and poisoning the waters with a plant which poisons the fish while not harming them for food.

They have no knowledge of traps or nets, depending for their success in hunting on their fleetness of foot and expertness in the use of the bow and arrow. Their run is swift and graceful, continuing for six or seven hours. Then they sit down and rest and drink pinole and start again. There are astonishing accounts of their speed and endurance. Lieut. Schwatka says that they ran seventy miles along with the stage and that he changed mules five times, and yet they beat the stage by an hour and a half.

They have a bright and happy disposition, are honest and temperate, not given to quarelling. It is said their language is poor, containing only two or three hundred words. No trace of legendary history has as yet been found among them, nor do they seem to have any old songs, though they are heard chanting a low monotonous song.

I made an examination of all the Indians belonging to the company. I found all of their jaws wider and deeper than the average jaw of Americans; the upper alveolar process unusually well developed. Depth of posterior columns and breadth of anterior columns are characteristic features. The teeth are deeply set, with broad, square crowns. The grinding surface of the molars and occasionally the bicuspid showed constant use in mastication, even among the boys. The oldest member was forty. The third molars are all well developed and in a vertical position, except in one case where one was missing, and there was abundant space back of the teeth. Their superior incisors do not overlap the inferior incisors, and the cusps of all the teeth are nearly on a line, showing the results of much grinding. The cusps of the

molars were less developed or more ground down than ours. Their vaults are low, the rugæ almost absent ; their tongues are small, and have the power of being carried far back into the fauces, pointing to great mobility and constant motion in shifting the food from one side to the other in the back part of the mouth. It is known that the mound-builders and other early tribes of Indians in America, who lived on shells, infusoria, and corn, possessed similar jaws and teeth, which leads to the supposition that these people are descendants of an early race.

Tartar and caries abound, pyorrhea is met with frequently. The absence of all care and cleanliness explains these conditions. Even slight irregularities are met with ; these, however, are not the result of small jaws, but of local causes.

The cavities of the crowns are all of the fissure variety ; those upon the buccal surfaces start from the buccal pit. In but few cases were there approximal cavities, indicating that the decay is more the result of improper enamel formation than of fermentation.

When the jaws of these Indians are compared with those of the average American, it will be seen that they are considerably larger and deeper, that the anterior columns have a greater diameter. From the description of their habits, it is evident that their mode of life is on the whole healthful. Plenty of muscular exercise, plenty of rest, quiet, cheerful dispositions, and a life not governed by conventionalities but in which natural impulses are allowed to sway conduct, are conducive to sound bodies. These large, well-developed jaws may be partly due to race peculiarity ; but there is no doubt, when we compare with these the unnatural position of the third molar in the jaws of many persons of the present generation, and notice the frequency of contracted arches, that the jaws are growing smaller, and that the prevalence of nervous strain brings about these conditions.

BRITISH MEDICAL.**SUPERNUMERARY TONSILS.**

By JAMES DONELAN, M.B. M.CH.,

IN September, 1888, I was consulted by a gentleman, aged 21, who complained that his tonsils were much enlarged, and occasionally very painful. His voice was at times hoarse, especially in cold damp weather, and his respiration at these times was attended with some difficulty. He also complained that he had a constant feeling that there was something in his throat which he "could neither swallow nor bring up." On examination I found that his normally placed tonsils were hypertrophied to such an extent as almost to meet in the middle line. Owing to the small space available, an attempt at a laryngoscopic examination was without result. I recommended him to have the tonsils removed and to postpone the further examination of his throat until the wounds had healed. I accordingly excised both his normally placed tonsils with Mackenzie's tonsillotome. The patient came to see me again after ten days. The wounds had healed, but he still complained of the substance that could not be swallowed, and of hoarseness with occasional difficulty of breathing. On examining his throat with the laryngeal mirror I was surprised to see another pair of symmetrically placed tonsils situated low down in the pharynx. Each of these bodies was about the size of a filbert, and their lower extremities overhung and almost entirely hid the entrance of the larynx from view. As on account of the position of these tumours it was impossible to remove them by means of the guillotine, I decided to use the galvano-caustic loop. Having applied a twenty per cent. solution of cocaine by means of a spray, I succeeded in passing the loop over the left body and removed it. No hæmorrhage took place, but the use of the hot wire evidently caused very severe pain. The suffering was indeed so great that the patient declined to have the removal of the second growth proceeded with on that day, but I saw him again two days later, and on that occasion removed it with the loop. The pain of this operation, in spite of the fact that cocaine had been injected into the mass as well as sprayed on its surface, was very severe. I call particular attention to this as an American writer has recently expressed the opinion

that the removal of hypertrophied tonsils with the galvano-caustic loop is a much less painful method than when the tonsillotome is employed. I heard nothing of this patient for over a year, but shortly before last Christmas his father called on me and said that his son had enjoyed excellent health since the operation, and that his voice was quite strong and clear. A microscopic examination of the four bodies showed that they all presented the usual characteristics seen in hypertrophied tonsils. I think it will be admitted that the case was a very unusual one in the fact that the supernumerary tonsils were bilateral and symmetrically placed below the normal glands, from which, however, they were separated by the posterior palatine fold, and an interval of half an inch. I have another case of supernumerary tonsil at present under treatment. The patient is a child of about 10, and has the normal tonsils slightly hypertrophied. In this case the supernumerary tonsil is single, and is situated in the middle line immediately behind the uvula. A rhinoscopic examination showed that it has no connection with Luschka's tonsil, which is quite separate, but is also hypertrophied. In this case the friends of the child object to the growth being removed by the loop at one sitting, I am, therefore, gradually destroying it by repeated cauterisations with the galvano-cavtery. I have made a rather extensive search in the libraries, and have not been able to find more than three similar cases recorded. The most recent instance is a case reported by Dr. Carroll Morgan, at the annual meeting of the American Laryngological Association last year, and in his paper he also refers to the only two other examples I have been able to find, namely, those of Jurasz. None of these cases, however, was bilateral or symmetrical. It would be interesting to inquire how it is that when hypertrophy of the adenoid tissue scattered over the mouth and pharynx takes place, it seems usually to occur in definite situations, and so rarely in other places which one might think were exposed to exactly the same influences.

TRACHEOTOMY UNDER DIFFICULTIES.

H. Harvey Norton of Reading writes :—I was called on the morning of April 29th to see J. E., a fishmonger, aged about 30 years, who has for years suffered from chronic laryngitis, and found him voiceless and with considerable dyspnoea, an

acute condition having evidently supervened upon his ordinary chronic inflammation, attributable, I think, to exposure to the east winds, and undue indulgence in whisky, I ordered sinapisms externally to the throat, a purge, inhalation, and medicine, and calling again in the afternoon, found him much relieved. But on passing the house about 8 P.M., I was called in and told he was dying. I found him unconscious on the bed, lips and extremities blue, pupils dilated, conjunctivæ insensitive, breathing stridulous, ribs drawn in during inspiration, pulse scarcely perceptible, and in fact at the point of death. There was evidently nothing for it but tracheotomy- I accordingly despatched messengers for a tube, bronchitis kettle, etc., but as the man was every moment becoming worse, I found I could not wait for the arrival of the tube, and was at my wit's end for a substitute, till, having examined all the available pipe stems, and found nothing suitable, I suddenly thought of a quill toothpick which was of largish bore. I cut the end off this, and having opened the trachea with my penknife, inserted the quill, and was delighted to find that it answered admirably, the patient being immediately relieved. There was some difficulty in obtaining a large silver tube, and I consequently had to hold the toothpick in position for an hour. On the arrival of the silver tube, with the assistance of my principal, Mr. Lowsley, I enlarged the opening in the trachea and inserted the tube, and so far the patient is doing well.

ADHESION OF THE SOFT PALATE TO THE PHARYNX, THE RESULT OF SYPHILIS.

At the Harveian Society of London, Mr. J. Ernest Lane showed a case in which complete adhesion had taken place between the free border of the velum palati and the posterior wall of the pharynx, so that the nasal and oral cavities were separated from one another posteriorly, a small aperture at the junction of the hard and soft palate being the only means of communication between the two. The cause of this deformity was a diffused syphilitic infiltration of the soft palate and of the pharyngeal wall; to this succeeded ulceration of the parts involved, and adhesion between the posterior pillars of the fauces and the wall of the pharynx. These adhesions gradually advanced inwards towards the middle line, the infiltrated tissue subsequently becoming converted into a tough

highly contractile cicatrix. Mr. Lane described this condition as one of considerable rarity, though partial adhesions were not uncommon. Loss of taste and smell usually resulted, and for the remedy of these conditions some operative measure might be deemed advisable, though in the present case the inconvenience was not sufficient to justify such a course. Mr. Lane also showed portions of the vomer and inferior turbinated bones which had exfoliated.

Mr. R. J. Carter showed a similar case in a cornet player, aged 32, who had had a primary sore sixteen years ago. The throat symptoms commenced eleven years after the initial manifestation. In this patient the face and scalp were covered with an ulcerating tubercular syphilide. The patient was still able to follow his occupation as cornet player.

HARELIP AND CLEFT PALATE.

Mr. Edmund Owen showed a case of harelip with cleft palate. The harelip had been cured, but the pins had been left in too long, so that unsightly scars were produced. Mr. Owen, who was not the operator, said that he had entirely discarded the harelip pins, and obtained excellent results from carefully inserted sutures.

The President, Mr. T. Bryant, said that for a quarter of a century he had given up using harelip pins. He asked whether the cleft in the palate had become smaller since the operation on the lips, as he found that this often happened in children owing to the increased pressure exerted by the lips and cheeks. He therefore postponed the operation on the palate until the child was a year old.

CHEMIST AND DRUGGIST.

PERFUME MAKING IN NICE.

THE first process in the manufacture of perfume from flowers and herbs is the extraction of the essential oil by distillation. A large copper vessel or alembic is filled with water to about two-thirds of its capacity; the flowers to be treated are then introduced, and it is hermetically [sic] closed. It is placed on a fire, gas or steam being mostly used for this purpose in Nice. Steam is thus generated in the cylinder,

and is carried by means of a pipe into a second cylinder, which is constantly kept replenished with cold water, and is furnished with an overflow cock. The pipe, in its passage through this second cylinder, assumes the form of a coil. This coil ends in a cock at the bottom of the cylinder, from which the volatile essence exudes drop by drop as the steam becomes condensed in its passage through the coil.

In this manner the essence is collected in a small glass vessel, while at the same time the water containing a small portion of the scent, and which still remains in the alembic aforesaid, is itself perfumed, and becomes the rose-water or orange-flower water of trade.

All flowers are not susceptible of this treatment—some of them, such as jessamine, violet, cassie, and tuberose, have to be treated by a different process.

Of the flowers producing essences the orange flower yields 1 gramme of essence for 1 kilo. of flowers. This oil is styled “neroli,” and is the principal essence produced in the district between the Var and the Italian frontier. The following table shows the proportionate yield of the different flowers :—

Neroli	-	1000 kilos. of flowers	1 kilo of essence.
Rose	-	25000 „	1 „
Geranium	-	1000 „	1 „
Mint	-	1000 „	0.750 „
Orange leaf (bit- ter)	-	1000 „	1 „
Lavender	-	100 „	0.500 „
Eucalyptus-	-	100 „	0.500 „

There are two processes used for the purpose of extracting perfume from flowers which do not contain volatile essence.

The first may be described as the cold process, and the second as the hot process.

The former is generally used for cassie (*Acacia Farneri-ana*), jessamine, jonquils, tuberose, violets, and some other flowers.

Freshly-gathered flowers are placed upon a layer of pure lard, a quarter of an inch in thickness, spread over a sheet of glass about two feet square, which is framed in wood and forms a tray. These trays, sometimes some 40 or 50 together, are then piled upon one another; the flowers are changed every 12, 18, or 24 hours, according to circumstances, and the process is thus continued until the lard is sufficiently charged with perfume. Jessamine and tuberose are frequently

changed as often as 50 times before the lard is considered to be sufficiently impregnated, cassie and violets from 30 to 40 times, and jonquils about 20 times only. In the hot process 20 kilos. of grease are placed in a copper vessel, together with some 5 kilos. of flowers ; the vessel is then placed over a slow fire, and the contents are well stirred. After allowing the compound to boil for ten minutes, the vessel is left to cool for some hours ; an additional 5 kilos. of flowers are then added, and the process is repeated until the fat has absorbed the requisite amount of perfume ; the hot liquid is then poured through a sieve, and the greasy flower-paste that remains is subjected to hydraulic pressure. It is in these two ways that the "pommades" of trade are produced,

The production of "extracts" from the pommades is very simple ; the perfume is conveyed from the impregnated fat into alcohol.

THE PRODUCTION OF PUMICE STONE.

As a matter of fact, none of the white pumice stone in general use is obtained from active volcanoes. It is true, Vesuvius has ejected pumice stone, for at the time when Pompeii was destroyed large quantities fell over the doomed city, but that pumice appears to have been only of diminutive size, and is gray in colour, and of the same inferior character as that found to the north of Naples. It is also probable that volcanoes situate in the southern seas emit pumice, for accounts are published of vessels sailing through quantities stretching for miles on the surface of the water. This, presumably, is similar to that taken from the sea near the Italian shores. It is small in size, and in the form of pebbles, having been rounded by the action of the water.

We are indebted, for our supply of stone, to actual deposits of the article discovered in one or two quarters of the globe, the best of which is at present to be found in the island of Lipari, situate in the Tyrrhenian Sea. The island is scarcely visited by any but Italians engaged in trading in its productions, such as currants, carpers, wine and pumice. It is mountainous, and consists of tufts and lavas and of highly siliceous volcanic products. The district where the stone is found is called Campo Bianco or Monte Petalo (1,500 feet above the level of the sea). The effect produced by the first

sight of the pumice deposit is curious, for, after riding a considerable distance, partly along precipitous paths, sufficiently dangerous to be interesting, and partly through vineyards and over grassy plains, one almost suddenly comes on a seemingly snow-clad narrow valley inclosed by hills, also quite white, and the whole glaringly bright on a sunny day, such as can be experienced in this southern latitude. Into these hills workmen are ceaselessly digging burrows, working within by candle light. In their excavations they came across many lumps of pumice stone, which are placed in baskets, subsequently being conveyed along the valleys to the seashore where small boats are loaded and sailed to the seaport near by where the stone is sorted, packed and shipped, to distant parts, either via Messina or Leghorn.—*Scientific American*.

DR. GEO. STAPLES ON MODELLING COMPOSITION FOR TAKING IMPRESSIONS.

I WILL make some broad assertions, all of which I am ready to defend whenever contradicted.

My first assertion is that modelling compound is better than plaster for all kinds of impressions, because : first, it is less disagreeable to the patient ; in the next place, for full sets, I can get as accurate an impression as can be made with plaster, a much smoother model than can possibly be made from plaster, in much less time, with less trouble ; and for partial sets, I can construct a plate from the model taken from the compound impression, that will fit as accurately when placed in the mouth, as can be made from an impression taken with any other material. Why subject yourself and your patient to the inconvenience and trouble of the plaster, when the compound will answer every purpose better ? I will give my method of using it, and ask all who have not done so, to try it as I have done, and report results : There are several grades of the compound ; keep about two, and by mixing use it just as stiff as can be introduced in the mouth, without burning. Use impression cup larger than for plaster, and a superabundance of the compound ; press it up slowly, and keep the lips and soft parts out of the way, until it is thoroughly adjusted all around ; previous to inserting, put a

Horton's rubber bib on ; use ice-water with the syringe until perfectly hard, before removing. I believe we can secure a better impression in this way than can be taken with any other material now in use.

SECURING IMMEDIATE SUCTION IN DENTURES.

Mr. L. C. Bryan writes to the *Cosmos*.—Some years ago, somewhere in dental literature, I came across a suggestion for securing immediate suction in a new dental plate or a newly-repaired one. It has been of so much use to me that I herewith submit it, and advise its trial. The plate is moistened, and then simply sprinkled with fine powder of gum tragacanth. The plate is then pressed in place, and no matter how good or bad a fit, it will hold firmly for a day under almost any use or abuse. The advantage of this will be apparent to anyone ; for the first half-hour or few minutes after a plate is put in for the first time makes or mars the reputation of the dentist, for the time being, in the estimation of the inexperienced patient, whose efforts to "suck up" a plate, if not immediately successful, are at once discontinued, the plate is taken out, and the invariable remark is, "It don't fit."

A patient will bring a rickety, ill-fitting plate, and after being without it the few hours necessary to repair it will insist that the plate fitted perfectly before it was confidently submitted to our care, but now it feels as though it had been made for another party. A thin coating of tragacanth will even up all irregularities, soothe the wounded sensibilities of the patient, and prevent the plate wounding the sensitive membrane of the mouth.

Tragacanth is a white gum like arabic, but has special advantages for this use, as it swells when wet by the fluids of the mouth, becomes sticky and of the consistency of jelly, but does not dissolve or wash out for hours. It should be kept in a salt or flour-shaker with fine perforations in the top, and should be sprinkled on the surface of the plate, shaking off all the free powder after a moment. Having no odour and little taste, it is in no way objectionable. It might be put up in suitable, perforated boxes and flavoured with winter-green, or otherwise made more elegant, mysterious, and costly. If the dentist is of the opinion that time and use will improve

the general adaptation of the plate, a small box of tragacanth should be presented to the patient with directions for use when there is a varying atmospheric pressure which may possibly affect the suction of the plate! Its use will also obviate the necessity for laboured explanations as to the cause of certain plates only resting on certain prominences of the maxillary and certain other tender places on the mucous membrane. It will be a relief to the patient, for the mental effort necessary to the intellectual digestion of these scientific dissertations, and to retain a credulous expression of countenance, is often evidently as painful as the sharp edges of the plate.

SOAP SOLUTION.

Mr. G. W. Adams writes to *Items of Interest* :—This is a handy thing to have in the laboratory. To make it, gather up all the small pieces of Castile soap, and shave them up thin and fine. Put them into an iron pan with just enough soft water to cover them, and place on the stove, or over your gas spider, and heat gently, stirring slowly, until the soap is all dissolved and the solution becomes uniform and of one homogenous mass. Care must be taken not to have much heat, or the soap will swell rapidly and “boil over.”

Before you commence the boiling operation, select a broad-top bottle and fit a brush nicely into the cork for future use. As soon as the soap is thoroughly dissolved, pour it into the bottle while hot.

This soap solution should stand on the work-bench within easy reach. Coat your model with it before immersing in cold water, when about to make a trial plate of gutta-percha. It prevents the hot plate from sticking to the cast and marring the face. When the case is inverted in the lower half of the flask, and properly trimmed and ready for the upper half, coat the model, plate, and wax—the whole of it except the *teeth*—before setting on the upper rim. This is somewhat antagonistic to the teachings of Professor Wildman, whose instructions were to “use soap solution only on naked plaster.” But experience is my dictator. After packing your case, soap the face of the model again just immediately bringing the parts together to prevent adhesion, if you should need to separate them again to either add more

rubber or to remove some. The soap solution can be used for coating the impression before pouring the plaster to make a cast, if you wish coloured plaster. But I prefer to use white plaster, and varnish my impression with shellac, to make a "colour line" of demarkation. The coating of the inside of the flask with soap solution, before using, will prevent the plaster from adhering so tenaciously.

[There used to be a patent on this process thirty odd years ago ; we paid 25.00 dols. for the privilege of using it.—Ed. ITEMS.]

SOURCE OF COLOURS.

THE cochineal insects furnish a great many colours. Among them are carmine, scarlet crimson, scarlet carmine, and purple lakes. A sea shell belonging to the purpura, and found in Japanese waters, gives a rich violet dye. The cuttlefish gives the sepia. It is the inky fluid which the fish discharges in order to render the water opaque when attacked. Indian yellow comes from the fæces of the camel. Ivory chips produce ivory black and bone black. Prussian blue is made by fusing horse-hoofs and other refuse animal matters with impure potassium carbonate. Various lakes are derived from roots, barks, and gum. Lamp-black is soot from certain resinous substances. Turkey red is made from the madder plant, which grows in Hindostan. The yellow sap of a tree of Siam produces gamboge ; the natives catch the sap in cocoanut shells. Raw sienna is the natural earth from the neighbourhood of Sienna, Italy. Raw umber is also an earth found near Umbria, and burnt. India ink is made from burnt camphor gum. The Chinese and Japanese are the only manufacturers of this ink. The process is a tedious one, and requires great skill. The finer grades of India ink are delicately scented with attar of roses, and one stick about three inches long may cost four or five dollars. Age improves the ink. Mastic is made from the gum of the mastic tree, which grows in the Grecian Archipelago. Bister is the soot of wood ashes. Very little ultramarine is found in the market. It is obtained from the precious lapis lazuli, and commands a fabulous price. Chinese white is zinc, scarlet is iodide of mercury, and native vermillion is from the quicksilver ore called cinnabar.

Dental News.

THE SELECT COMMITTEE ON HOSPITALS.

At the third sitting, Mr. Nelson Hardy, F.R.C.S., Ed., stated he held a strong opinion that there were defects in various particulars of the out-patient departments, especially at the large endowed hospitals. He was of opinion, that in many cases the treatment was unscientific, and in others wrong. Such unscientific and wrong treatment, he thought, was unavoidable in the present overcrowded state. No doubt there was some danger of infection arising from the crowding. He had heard one of the physicians of the London Hospital boast that he could see a case in less than a minute.

I do not think it is of the slightest use, so far as the poor are concerned, to keep up out-patient departments. The poor can go to the Poor-law dispensaries or at their homes. From a student's point of view it would be very well to limit the number of out-patients to just sufficient to enable instruction to be afforded. Abolish the out-patient department except so far as consultative cases, and three-fourths of the patients would then be transferred to the dispensaries. Witness said he did not think that would cause at the dispensaries the same overcrowding as he complained of now at the hospitals; in fact, he was informed that there were medical officers connected with some of the Poor-law dispensaries who had not three fresh cases a week. If the number increased very much indeed, the Local Government Board could easily increase the medical staff. He would suggest that all hospitals should be registered, and that there should be a Government inspection every year, or oftener, if necessary. The only special hospitals that had justified their existence, were woman's, orthopædic, and ophthalmic, and even of those there were too many. He did not think either chest or cancer hospitals, nor even children's hospitals were necessary, for they should be sent to the general hospitals. The cost per bed was, at the hospitals, so far as could be ascertained, more than double the cost of the beds at the Poor-law infirmaries. Hospitals for incurables he placed on a different footing, and they were quite necessary; they were more in the nature of asylums.

His object was to prove that inquiry was necessary.

The great majority of the medical profession, he thought, excepting, perhaps, some connected with the special hospitals, desired to see a reform.

At the fourth sitting, Mr. Bousfield stated it was his strong opinion that there was a want of organisation generally amongst hospitals, and in particular in regard to the out-patient departments. At King's College Hospital during his active connection with it there was an inquiry as to that department, and an officer was appointed to ascertain the position and circumstances of the out-patient applicants, with the result that there was a great diminution in the number of applicants. Inquiries made some years ago showed that some of the patients were treated very hurriedly; but, on the other hand, a very considerable time was given to certain other cases which were considered interesting and valuable to the medical school. He considered that the out-patient departments should be used more for consultative cases. The general hospitals with medical schools attached were, as a rule, economically and well managed. The data upon which the accounts were based were different, and the returns of the hospital committee as to cost of beds was not quite reliable. There should be some common system of treating accounts. He held the opinion that it would be a wise thing to map out London into territorial areas for hospital purposes. It would be a serious matter, but St. Thomas's was removed. General hospitals were not working together, nor with the special hospitals or dispensaries in their districts. The provident dispensaries should be affiliated with the general hospitals. There should undoubtedly be some central body to exercise some control over the hospitals.

He expressed his opinion that subscribers' letters might be done away with in the case of general hospitals without effecting the practice at all. It was desired to make the infirmaries State-aided hospitals, rather than Poor-law institutions. He was in favour of admitting clinical teaching at the Poor-law infirmaries. It would raise the character of the infirmaries and be very valuable for the progress of medical knowledge, because so many cases available for teaching were now excluded from ordinary hospitals. If there was some system of payment there would be no difficulty in providing additional hospital accommodation for London if necessary. He could not say it was absolutely wrong, although it was contrary to sound principle, for a person to send his servant to a hospital for relief, paying something for the relief. The

latest improvements in surgical instruments were adopted at the large general hospitals, as the medical school authorities were anxious to improve the teaching. Undoubtedly the experiments made were for the benefit of the public as well as for the medical school and the patients. The number of sham dispensaries had done harm, and there was a certain class of practitioners practising among the poor at low ready money fees. They had started so-called medical provident societies, which were not provident in any sense, and scandals had from time to time occurred at those places, so that persons had been prejudiced against real dispensaries. Many cases have come out in which medical men who are qualified have opened these doctor's shops, which, however, have been worked to a considerable extent by unqualified assistants, and the medicine is very bad. The remuneration of medical men at provident dispensaries were taken out of the contributions of the members, and last year £1,854 was divided amongst 71 medical men. It would, he considered, be a good thing if all midwives were registered under some society.

At the fifth sitting, Dr. Hugh Woods, Highgate ; said there was one reason why the hospitals were more costly than infirmaries, and that was the better supply of nurses. But still the cost was, he thought, much too high. It was an almost invariable rule in the metropolitan hospitals that the members of the staff should hold a diploma from the College of Surgeons, or the College of Physicians in London. The general medical teaching at the London Hospitals was on a bad and unsatisfactory system. It led to the indefinite multiplication of small medical schools to the deterioration of the education given. The number of students for the whole of London was not more than would suffice to form three satisfactory medical schools.

Sir Edmund Hay Currie said, every patient was treated at the London Hospital, and then enquiry was made as far as possible ; but he did not think any system of that kind was really efficacious. He did not consider that anyone should go to the London Hospital to be treated free except for the preservation of life, because it was governed by a charter. Therefore they could not very well alter the rules and regulations, and take away the privileges of the governor of sending patients. There were no spare beds at the hospital—in fact, another hospital was even required. There was a cry of want lower down, nearer the eastern boundary. If he had

to set about working the hospital on a provident system, he should take care that there was affiliated to it a certain number of provident dispensaries; and for a mile radius he would district the population to the hospital, and that would give about 750,000 persons to the institution. Everyone should be required to systematically to pay a small fee, and they should first be seen by a doctor appointed by a committee. The hospital should be as it were their family physician. Such a system would be better for the patient, especially in regard to treatment. In the Poor-law infirmaries, there was no one to look after the medical men, and no one to prevent experimenting upon cases, but at the hospitals the medical staff dare not try an experiment, because there were too many students looking after them. He would not like to say that the Poor-law infirmaries were undermanned, but he thought they all wanted looking after, and it was not therefore right for a medical man to be in charge of such an immense place without some outside medical power coming in. There should in every hospital be a definite person to whom complaints should made. There was a strong feeling among the poor against going to the Poor-law, and he believed that a stigma of pauperism was attached by the poor going to the Poor-law. That feeling was increasing.

The Chairman: A previous witness has stated that the feeling is decreasing—.

The witness then gave a short historical account of the Metropolitan Hospital. The hospital had a district of a mile radius, comprising Bethnal Green, Shoreditch, Haggerston, and Dalston within the circuit, and there was about a quarter of a million of poor persons within the radius. The poor came and paid their contributions. They were entitled to be seen at the hospital by paid medical men living within the district, and having a private practice. The scale of subscription was: Adults 1d a week, or 4d. a month; children 2d. a month each, or 6d. a month would include all children in a family under the age of 16. There was an entrance fee of 6d. for every single person or for a whole family, except in the case of members of benefit societies, who were not required to pay an entrance fee, but whose other payments would be the same. The system had been started about two years. No person was allowed to join the provident scheme if he earned more than 21s. Probably a good many went to the dispensary rather than to the general practitioner, because the poor had greater confidence in a hospital. The Metro-

politan Hospital provident system was not yet paying its way. The numbers were not yet sufficient. The system was very young, and wanted working on a little more comprehensive scale. The persons on the books of the hospital were chiefly those in regular employment.

The limit of 21s., is it to benefit and protect the local practitioners ? ”

It was contemplated reserving certain beds for persons who would pay the whole or portion of the cost.

At the Sixth Sitting Mr. Bruce Clarke, F.R.C.S., stated that at St. Bartholomew's, about 250 to 260 patients were seen in an hour, but there were between 40 and 50 persons to attend to them. There were 10 house-surgeons, and under them about 40 dressers working under supervision. It is erroneous to say that each patient has only a minute's treatment. It was practically impossible for students to see patients on their own responsibility, so far as supervision could prevent it. He expressed the opinion that, from the candidate's point of view, the system of election to medical appointments at St. Bartholomew's was not satisfactory. He did not, however, think that any exceedingly good medical man would lose an appointment by reason of not being a successful canvasser. A university for London to which Students should belong is one of the most important questions of the day. There was, he continued, much misconception prevailing as to the supervision of students. They were much more strictly supervised than was generally imagined. I only object to a medical university which would be attended by officers who are entirely outside hospitals.

Sir Morell Mackenzie stated that in the interest of both the profession and the public, both general and special hospitals were required for educational purposes. The general hospital special departments had not treated patients suffering from special diseases nearly as successfully as at the special hospitals. In spite of the system of payment generally in operation at the special hospitals, a good many poor persons came. He would like to see the system of payment extended to all hospitals. He would not like to see any restrictions placed upon the building of additional special hospitals. London drew from the whole country, and the building of new special hospitals was not, speaking generally, more than was required for the increase of population. If at

the special hospitals the patients could be better cured (as was the case) than at the general hospitals that was a good reason for their existence. It did not follow that the cheapest hospital was the best. The cost per bed at general hospitals varied as greatly as the cost of the beds at different special hospitals. There should be a very strict enquiry as to the need and circumstances of the patients. The difficulty of inquiry was the extent of organisation which would be necessary. The mode of appointment to the hospital staff, is, I think, defective in this way: A man cannot, as a rule, be connected with the permanent staff of the hospital unless he be a Fellow of the College of Surgeons or a Member of the College of Physicians, whereas he might hold a much higher diploma—he might hold a high position in the University of London, or at Oxford or Cambridge, but unless connected with one of the Colleges, which was a much lower degree, he could not be appointed. In the same way that applied to a Dublin or Scotch diploma. Students from general hospitals went to the special hospitals for educational purposes. The College of Surgeons did not require a special examination, and the students went to special hospitals to acquire knowledge of special diseases after passing their examination. He was sure that direct benefit had arisen to the science in Surgery by the creation of special hospitals. The estimated number of out-patients at the hospitals in London of over a million was, he thought, very much exaggerated, otherwise one out of every four of the metropolitan population would be an out-patient. If there could be a fairly organised central authority of an impartial character, he would be glad to see one whose duties should be to arbitrate in cases of dispute or scandal, and to arrange as to the publication of accounts. There was a general tendency for young doctors to become specialists when they first started. That he considered wrong. They should study general diseases before practising as specialists. After a large experience of general diseases they would not be likely to forget what they knew, although practising as specialists. Special hospitals could not very well accept the provident system as it had hitherto been carried on. The rates for the special hospitals would have to be much higher.

THE New Zealand Herald gives the following account of the first prosecution under the New Zealand Dentists' Act. In Christchurch, on March 6th, J. D. Hellewell was charged before Mr. R. Beetham, R.M., on the information of Audley Edward Merewether, that, not being a legally qualified medical practitioner, and not being registered under "The Dentists Act, 1880," nor under any other legal enactment, he did unlawfully use the title of dentist. Evidence was taken, Mr. Joynt appearing for the informant, Mr. Widdowson for defendant. The Bench imposed a fine of £5, with costs. This conviction practically dispels the opinion that a "carriage and four" may be driven through the New Zealand Dentists Act with impunity, and will cause less surprise than the long delay in testing this question and that initial proceedings should be left to the sole responsibility of a dental student. In June last, at a meeting of dental delegates held in Wellington, a New Zealand Dental Association was formed and which a few weeks ago held its first conference at Dunedin. One of the primary objects of this Association is to maintain the provisions and carry out the intention of the Dentists Act, in other words to prevent the use of the title of Dentist, or any equivalent thereof, and the practice of dentistry by any but legally qualified persons, that is, by persons whose names appear upon the Dental Register of New Zealand, or upon that of the United Kingdom, or Imperial Register. At the recent conference several cases were cited of at least *prima facie* gross violations of that Act, demanding prompt legal action. Was the Association prepared to institute proceedings? The Dentists Act, it was said, though evident as to intention, was inexact and incomplete in its wording, and could be evaded; that, as it now stood, it would be impossible to obtain a conviction. Eminent legal opinion, it was believed, had confirmed this impression. It was decided to obtain further legal opinion. Accordingly, the question of the adequacy of the Act as now worded, and of the legal liability of the alleged cases of violation, was placed before Sir Robert Stout, who held that the Act as it now stood was quite adequate to deal with such cases, and that where the Act was as he deemed defective an amendment could be readily drafted and make "assurance doubly sure." Events, however, moved faster than the action of the Association. The Association, it was thought by some, was cautious to timidity. It was rightly felt by dental students, who, at great cost, were loyally complying with the conditions of the Act, and in some in-

stances seeking higher qualifications than the Act demanded, to be a gross injustice that others who had not complied with those conditions, and who held no legal qualification whatever, should be allowed to practise as if duly registered and qualified. Better no law than a law any man sufficiently unscrupulous could evade with safety. It was simply the deep sense of this injustice, and probably a degree of impatience at the cautious step of the Association, that led Mr. Merewether, a dental student of Christ church, to institute, solely on his own responsibility, the above prosecution. The premature and wide spread decay and loss of the teeth in this and other Australasian colonies is on all hands acknowledged and deplored. How far this miserably defective dental condition affects the public health in these colonies it is impossible to tell—that it does so to a serious and depressing extent cannot be doubted. Yet the difficulty of preserving the teeth is great and becomes greater every year. This is the vocation of the dentist, his most legitimate as it is his most beneficent task—how difficult and important, and how necessary and reasonable the public demand for the best possible skill and treatment, is shown by the fact that throughout Europe and America the standard of qualification has been raised higher and higher.

AT the “commencement” of the Meharry Medical College for Negroes, held on February 27th, diplomas in medicine were granted to fifteen candidates. Two “coloured persons” at the same time received diplomas in dentistry and one in pharmacy.

THE BRITISH MEDICAL understands that Lord Sandhurst, Chairman of the Select Committee of the House of Lords appointed to inquire into the general management of Hospitals, will, take advantage of the Whitsuntide recess to visit the hospitals of Paris and Vienna.

THE AMSTERDAM QUININE FACTORY have during the past year sent out about 400,000 oz. of quinine sulphate, irrespective of other quinine salts.

THE birth and death rates for the City of London were shown by the last fortnightly return to be equal—namely, 14.15 per 1,000 of the population per annum.

IF a sufficient number will take advantage of it, a special steamer will be run from Leith to Hamburg to convey travellers *en route* to Berlin to attend the International Medical Congress. Any Scotch members proposing to attend should communicate at once with Dr. G. A. Gibson, 17, Alva Street, Edinburgh, secretary of the Scottish Committee.

THE meeting of the British Association at Leeds will begin on September 3rd, when the retiring President, Professor W. H. Flower, will resign the chair in favour of Sir Frederick Abel, who will deliver the inaugural address.

QUACKERY IN ITALY.—The Italian Superior Council of Health has been occupying itself with the question of the suppression of quackery in Italy. The new law on "the illegal exercise of the health-giving arts" is very stringent in its provisions against unqualified practice, and if the medical authorities could be got to enforce it, quacks would speedily find Italy an unprofitable soil for their nefarious husbandry. Since the beginning of this year 420 persons have been prosecuted under the new sanitary law, and in many cases, although the offence has been clearly proved, the defendants have escaped punishment. The Council appeals to the Minister of Grace and Justice to instruct judges and magistrates, in such cases, to carry out the law in its full strictness.

A DECREE has been passed by the Convocation of the Oxford University to proceed to the election of a Deputy Professor of Comparative Anatomy, owing to the continued illness of Professor Mosely. The emoluments have been increased by a special grant to 2,700 per annum. Several names have been mentioned in connection with the appointment, amongst them being those of Professors Ray Lankester and Milnes Marshall.

APPOINTMENTS.

Mr. Frederick Lonnon, L.D.S., Eng., has been elected Dental Surgeon to the "Camberwell Provident Dispensary."

Charles E. Peckover, L.D.S., Eng., to be Hon. Dental Surgeon to the Brighton Blind Asylum, *vice* A. A. Fox resigned.

VACANCIES.

Royal Free Hospital, Gray's Inn Road.—Dental Surgeon. Applications to the Secretary, Conrad W. Tides, by June 4th.

Charing Cross Hospital, Strand, W.C.—Assistant Dental Surgeon.—Candidates to be members of the Royal College of Surgeons, England, and Licentiate of Dental Surgery. Applications with copies of testimonials, must be sent in addressed to the Treasurer, on or before Saturday, June 7th. next.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

FLAGG'S "PLASTICS AND PLASTIC FILLING."

To the Editor of the British Journal of Dental Science.

Dear Sir,—The third edition of this book appears again with an extraordinary statement. On page 56, he publishes two assays of alloys stated to be made by me, but which in no respect, and in no proportion of any metal bear the slightest resemblance to any alloy ever made by me, nor would alloys, made according to the published assay, have any properties like any alloy I make. In one assay, *two* important metals in the alloy are not even mentioned.

Dr. Flagg also expends much eloquence on the qualities of gold and platinum in alloys. It is evident that the use of gold in an amalgam has never entered into his mind, and he remains unaware that gold is used in amalgam, in this country at all events, solely for the purpose of making it clean and pleasant in working, and that its other properties are comparatively unimportant, and in many respects similar to those of tin. It is very well known that the setting time of any silver tin alloy can be ruled by the proportion of platinum added. Why Dr. Flagg should take so very much trouble to inform his readers that he does not know this, is not easy to explain.

THOMAS FLETCHER.

HOSPITAL REPORTS.

ALUMINIUM AS A DENTAL BASE.

To the Editor of the British Journal of Dental Science.

Sir,—In your issue of May 1st, I read the discussion on Aluminium as a Dental Base by Mr. Macleod and others with considerable interest. I may state what led me to make Dentures of it. (I do not want to argue at present, however, who used the metal first, as that can be ascertained as a matter of fact by reference to dates.)

About 30 years ago, when I was a student at the Andersonian University, Glasgow, under Dr. Penny, Professor of Chemistry, he gave a lecture on Aluminium, and said, that it might do for Dental purposes, if a solder could be found for it. After the lecture, we had a conversation, when I suggested that it might be used in combination with vulcanite.

The Professor became quite enthusiastic over the matter, and requested me to make an upper set of teeth for him with the metal, (he was wearing a gold plate at the time, that was very unsatisfactory.)

After the new Denture was made, he wore it constantly for two years, when the metal was as pure and perfect as when it left the polishing brush. I then took out a patent for it. The Professor wore the Aluminium plate till his lamented death. His wife wore one for 13 years, and within the last month, I made a new case of teeth to a patient who was still wearing an upper Denture in Aluminium that I made to her 26 years ago. No metal can be compared to it for Dental purposes, if it was always made pure, but when I used it, it was shamefully manufactured, and irregular in character. Not infrequently, when the plate was being struck up, it would go into reeds, and indicate the unprepared clargic matter. This was my principal reason for giving up the use of Aluminium, for such impure material would get corroded in about five years.

JAMES WALLACE, L.D., Glasgow.

Dental Hospital Reports.

MONTHLY STATEMENT of operations during April, 1890.

	London	National.
Patients		1806
Extractions	1491	157
" under Anæsthetics	794	571
Gold Fillings	257	104
Other Fillings	741	321
Irregularities	60	134
Miscellaneous	533	191
Artificial Crowns	28	5
Total		2183

House Surgeons

T. A. GOARD,
V. KNOWLES,
J. A. MALLET,

WM. FISK,
A. PRAGER.

British Journal of Dental Science.

No. 538. LONDON, JUNE 16, 1890. VOL. XXXIII.

ON THE INTER-DEPENDENCE OF RHINO-PHARYNGEAL AND DENTAL DISEASE.*

By WILLIAM HILL, M.D., B.Sc., (Lond.)

Senior Demonstrator of Anatomy, and Assistant in the Aural Department, St. Mary's Hospital; Vice-President Otological Section, British Medical Association.

Mr. President and Gentlemen.—It is with the greatest possible pleasure that I have availed myself this evening of the kind invitation of the office-bearers of your Society to air my views on certain subjects germane to our respective specialties.

Both rhinologists and dentists acknowledge the frequency of cases of suppurative catarrh of the antrum, which have resulted from diseased conditions of the teeth, and occasionally we find dental disease following on a morbid state of the nose, and its large maxillary sinus. And again, hypertrophy of the tonsils and inflammatory enlargement of the glands of the neck, especially in certain diathetic states, are often seen in relation with carious conditions of the teeth. Moreover, cases are every now and then met with in which granular pharyngitis, hypertrophy of the lingual tonsil, pharyngeal tenesmus, and chronic sore throat can only be successfully treated by removing sources of irritation and contamination in the mouth. In addition, one writer, at least, (Mac Donald) has gone so far as to suggest, that the contracted dental arch and vaulted palate affords "a very simple explanation of post-nasal growths," that is, of stalactite overgrowth of the pharyngeal tonsil.

The fact that *some* lesions in the nose and pharynx are the direct result of dental disease is, therefore, sufficiently obvious, but the title of my communication, viz.:—"The

* A Paper read before the Students' Society of the National Dental Hospital.

Inter-dependence of Rhino-pharyngeal and Dental Disease," will have prepared you for the contention that, in *some* instances at least, morbid conditions of the teeth and jaws may result from nasal and pharyngeal disease. This latter proposition, I am aware, is not so obvious as the former, and is, moreover, one not generally accepted. Yet it is no new hypothesis, and has been urged from time to time by many observers.

Catlin, in his work entitled "Shut your mouth and Save your life," thirty years ago, drew attention to the coincidence that irregularities of the jaws and dental caries were almost entirely absent in the native Indian races, who possess regular and well developed nasal cavities, and who therefore have no necessity to indulge in the pernicious habit of mouth-breathing. This correlation he contrasted with the prevalence of irregularities of the jaws and dental caries in more civilized races, amongst whom obstructed nasal respiration and mouth breathing is so common. What is true of the native Indian races obtains also, as your text books tell you, in regard to the teeth amongst Arabs, and the uncivilized aborigines of Africa, Mexico, South America, Australasia, Malaysia, &c.

Sir James Paget, writing in the *Medical Times and Gazette*, February 6, 1858, makes the following remarks:—"There is a physiognomy by which the children and young people that have simple enlargement of the tonsils may usually be known at once. Together with a general appearance of feeble health they have a peculiar shape of the mouth and jaws. The jaws are narrow, so that the teeth are crowded and look disproportionately large. The aperture of the mouth is small, habitually slightly open; the edges of the lips thick, but not pouting, the lower lip rather inverted; angles of the mouth a little raised; the front of the mouth is almost uniformly convex; the lower lip scarcely recedes towards the chin, but projects with a broad convexity, as if its middle part were slightly pushed forward by the tip of the tongue. The general expression is that of a gradual narrowing and a smooth uniform rounding of the lower part of the face, which make it look small and featureless. These peculiarities of shape appear due, partly to defective growth of the jaws, and partly to the habit which the patients have of advancing the lower jaw and tongue, into the position in which these parts are yet more evidently held during acute inflammation of the tonsils."

Again, E. Wagner, writing in 1875, on diseases of the palate, draws attention to the association of adenoid growths of the naso-pharynx and deformities of the maxillæ and pharynx.

Michel, of Cologne, in 1876, wrote—"Since I have observed the shape of the roof of the mouth, I have found in corroboration of a remark in E. Wagner's "Diseases of the Soft Palate," that it is often seen to be pointed and high arched, and that the front teeth sometimes project outward to some degree in moderate hypertrophy of the pharyngeal tonsil." Michel goes on to explain the high vault as due to want of expansion of the nasal cavities from abeyance of the nasal respiratory function. He further remarks, "If not the opening of the mouth, the pointed shape of the upper jaw, so often observed in those belonging to the English nation, may have its origin in hypertrophy of the pharyngeal tonsil," and he adds, "in cases of high degree the nares are strikingly small, also the whole cartilagenous portion of the nose in consequence of this incomplete development."

Some years later, David, in 1883, endeavoured to explain this association by suggesting that in mouth-breathers with naso-pharyngeal obstruction, the palate in course of development is pushed upwards and vaulted by reason of the greater air-pressure on the buccal than on its nasal surface—an obvious absurdity.

Some years ago, Tomes, noting the association of mouth-breathers with enlarged tonsils and contracted V-shaped and saddle-shaped maxillæ, pointed out, I think, very correctly that the lateral pressure on the alveolar processes caused by the dropped jaw, acting through the buccinators and tissues of the cheek, is at least a factor in the production of the narrow dental arch.

This short and imperfect historical sketch goes to show that during the last thirty years there has been a tendency on the part of a few observers to regard associated morbid conditions of the rhino-pharyngeal tract on the one hand and dental disease on the other, as interdependent. The association cannot be doubted, and is not, in fact, disputed, but that the question of the interdependence of the associated conditions is still *sub judice* was evident from the discussion at the Odontological Society which followed Dr. Spicer's interesting communication, in which he re-examined and reviewed the whole subject.

Let me in the first place ask your attention for a few mo-

ments with reference to the subject of irregularities and deformities of the upper jaw. It is impossible to criticise all the theories which have been put forward to explain these conditions, but it is obvious that no one hypothesis is likely to prove generally acceptable as competent to explain *all* maxillary deviations, in *all* cases. There are many factors concerned in the normal expansion and growth of the upper jaw, and I am not prepared to urge more than this, that a rhino-pharyngeal obstruction to normal nasal respiration is one retarding factor. Heredity, artificial selection, racial peculiarities, civilization, diet, trigeminal and other nerve influences, thumb-sucking, exanthematous fevers, struma and traumatism singly or more or less in combination, are doubtless also concerned in maxillary and mandibular deformities and dental irregularities, but with these influences, I am not now concerned.

Some stress is rightly laid in the Dental text books on the influence of the sphenoid or wedge-bone in the development and expansion of the cranial maxillary and other bones, a subject first elucidated by Hilton. Any factor, whether hereditary, or otherwise, which retards and diminishes the growth and expansion of the wedge must tend to maxillary stunting, and therefore to small choanæ and narrow contracted jaws. The fact that the growth of the body of the sphenoid and the expansion of its cavity or sinus is important in pushing down the vomer, and so lowering the level of the palate is very suggestive; it must be remembered that the formation and expansion of the accessory nasal sinuses takes place largely during the period of eruption of the permanent teeth, i.e., during the period of life when adenoid growths are commonly met with, and it is difficult at first sight to explain why enlargements of the naso-pharyngeal and faucial tonsils should retard expansion of the antral sphenoidal and other sinuses except, as suggested by Michel, and adopted by Spicer, on the ground of rhino-pharyngeal obstruction leading to abeyance of normal nasal respiration and functional disuse in the mouth-breather, the various sinuses being accessory to the nasal respiratory function, and serving as reservoirs or warming chambers.

But though abeyance of nasal function may lead to a small nose, small sinuses, and therefore to ill-developed and contracted maxillæ, is it not probable that interference with the normal tonsillar function, which must accompany hypertrophy of the naso-pharyngeal and faucial tonsils may have something to do with the condition? It must be

remembered that one of the rôles of these glands is to receive the lymphatics from the nose and its surrounding bones; hypertrophy of the glands must result in impeded lymph flow and congestion in the neighbourhood of the adjacent sphenoid and maxillary bones, and it appears to me probably, that lymph-stasis with its resultant hyper-nutrition leads to early ossification, and therefore the bones and sinuses reclaim certain more or less infantile characteristics.

At the same time other influences are at work at the inferior plane in all mouth breathers; there is no doubt that the normal position of the tongue with the mouth closed, is with that organ lying against the hard palate; so placed it cannot but affect the shape of the growing palate tending to flatten it out and preventing such contraction of the alveolar processes as is seen in the saddle-shaped and V-shaped maxilla and vaulted roof. The affect of the lateral pressure of the normally placed tongue and lips in correcting irregularities of the permanent teeth is well known. During mouth breathing, from whatever cause, the expanding force of the tongue is in abeyance, the upper lip is raised and allows the incisor teeth to protrude, and the weight of the dropped lower jaw pulling through the buccinator and tissues of the cheek acts as a lateral compressing force causing maxillary contraction, especially in the neighbourhood of the bicuspid.

But mouth breathing, the result of lymphoid and other obstructions in the rhino-pharyngeal tract is probably concerned in the production of dental caries as well as being a factor in maxillary irregularities.

Catlin, thirty years ago, pointed out that the flushing of the dental apparatus with alkaline saliva (which takes place in normal respiration with the mouth closed and the tongue against the palate) is seriously interfered with in the victims of buccal respiration, and showed that the teeth which decay soonest are those which are least flushed by the buccal fluids. One of the commonest symptoms complained of by mouth breathers is the dry throat and dry mouth on waking in the morning; the throat becomes more irritated during sleep than at other times, and it is probably true that the processes concerned in the production of dental caries are more active during sleep, and especially active in mouth breathers.

In the ordinary way, with the mouth closed and the tongue filling the oral cavity, far less saliva is poured into the buccal region during the night than during the day, because of the

absence of the stimulus of food and quiescence of the mandible and masticatory muscles during sleep. With buccal respiration going on the small amount of alkaline saliva will soon be diminished by evaporation, and the mouth becomes dry ; moreover concentration of the buccal fluids almost invariably leads to acidity in the mouth, and it stands to reason that mouth breathers with their comparatively dry buccal cavities are more prone to an acid reaction of the oral fluids than those who respire normally through the nose.

It is well known that the human mouth forms an excellent culture medium for micro-organisms ; during health a number of microbes, some innocent some pathogenic, lead a bare existence in the oro-pharyngeal tract, but on any deviation from the normal they pass from the nearly harmless quiescent stage into that of active reproduction. Germination in the acid mucus is accompanied by the generation of lactic, butyric, acetic, malic, and other acids ; of these probably the chief and most important, lactic acid, is produced by the fermentation processes of the lactic acid bacterium. This acid production is much greater at night when there is less chance of salivary neutralization and when the movement of the tongue and lips are at rest. Moreover, similar conditions will favour the microbic decomposition of food debris between the teeth, which again is accompanied by the generation of acids. The reproductive processes of micro-organisms and the formation of acids, and especially of lactic acid, which goes on nightly in the mouth breather, *must* tend to excite a carious process in teeth otherwise predisposed, by their quality, structure, position, shape and pitting. Decompositions with the production of acids in secluded recesses leads to solution of enamel and to the establishment of those carious processes in the dentine in which micro-organisms probably play a further part.

Now we must also remember that frequently flushing the mouth with alkaline fluids is not the only means the organism has for checking the baneful processes associated with microbic reproduction in the mouth. As you are aware healthy buccal fluids contain a number of bodies known as the salivary corpuscles ; these cells exhibit amoeboid movements and differ in no way from the ordinary leucocytes or white corpuscles of the blood, except that they are a little larger. These bodies were formerly believed to originate in the salivary glands, and it is probably true that some of them do find their way into the saliva by migrating from

the blood vessels into the salivary ducts, but it is now known that the tonsils are the chief source of these bodies which migrate from the lymphoid follicles into the mouth and pharynx.

(Dr. Hill here digressed, and by means of diagrams, &c. gave a very clear and interesting account of the rôle of the various tonsils in health and disease.)

As regards the function of these corpuscles endowed with amœboid methods of locomotion and digestion, it would appear that their rôle is to act as scavengers in the alimentary respiratory, and other tracts in which they are found, hence they have been aptly named *phagocytes*. Wandering phagocytes, whether in the blood, the tissues, or in the alimentary and respiratory tracts are able to devour and kill morbid germs such as micrococci bacilli, and bacteria, and they appear to check the reproductive processes of these micro-organisms. Moreover, like their prototype the amœba, they can ingest and digest small particles of food debris which may have lodged for instance, in crevices and pits of the teeth; they therefore well deserve the name of scavengers, and the various tonsils may be compared to police barracks, continually sending out small detachments of constables in order to clear away nuisances, and hold in check micro-organisms.

Scavenging by the phagocytes or salivary corpuscles, *flushing* with alkaline saliva, and the *scouring* of the teeth by the lips and tongue, are the three principal precautions adopted by nature for the prevention of those chemical and microbic processes in the mouth which lead to caries of the teeth. It is easy to understand that in chronic disease and enlargement of the various tonsils, whether antecedent or subsequent to dental caries, that the supply of phagocytes is diminished, and the contamination of the oral fluids unchecked quite apart from the superadded evil influences from mouth breathing.

From a consideration of the subject matter of this communication I think we are right in concluding that the health of the teeth as also of the pharynx, to some extent, depends upon normal nasal respiration. Diseased conditions of the teeth may lead to abscess or suppurative catarrh of the antrum, to the presence of foreign bodies such as teeth, calculi, and portions of necrosed bone, in the nasal, or in the antral, cavities, and also to morbid lesions of the adjacent leucocyte-producing structures, including enlarged faucial, lingual and pharyngeal tonsils, chronic hypertrophic pharyngitis and

inflammatory enlargements of the glands of the neck. On the other hand Rhino-pharyngeal disease may lead to antral suppuration which may in turn affect the adjacent teeth, producing alveolar and dental abscess; or if mouth breathing be established, we may expect frequently to find as results, stunted and mishapen maxillæ and mandibles, contracted and vaulted palates, together with dryness of the mouth, and with the acid oral secretions further deteriorated by the pressure of pathogenic micro-organisms and the scarcity of phagocytes or scavengers.

The points which I should especially like to hear discussed are the suggestions of my own, as to :—(1) The early ossification and stunting of the sphenoid, maxillary and mandibular bones, from obstruction to the lymph circulation in chronic inflammatory conditions of naso-pharyngeal and faucial tonsils. (2) The influence of the position of the tongue in the moulding of the palate and on the prevention of deformities and irregularities of the jaws and teeth ; (3) The importance of a healthy condition of the phagocyte-producing organs, the scavengers from which assist in the prevention of those chemical and biological processes which are the antecedents of caries.

PRESIDENT B. T. MASON'S ANNUAL ADDRESS*

Gentlemen,—This, the twenty-second meeting of the Fifth District Dental Society, finds us all again in Utica.

The year just passed has been a most prosperous one, I trust for all of us ; and we have passed another milestone in the history of dentistry. With our band of membership unbroken, which, among the many things for which we have cause to be thankful, transcends them all.

The progress of the dental profession has been onward and upward with more rapid strides than ever before, and we have just cause for pride in the profession we have chosen that she has taken a forward position among the learned professions, and has the lead of them all as to progress and advancement. This I attribute not to there being greater cause for advancement in ours than other professions, but to the fact

* Before the Fifth District Dental Society of New York, April, 1890.

that we have among us those who are not content with that which is good, or satisfied with that which is better, but will only accept that which is best.

May the wheels of our progress never be blocked, and our advancement be rapid, healthy and vigorous, until the ultimatum is reached, and that filling discovered which meets all our requirements, and our general approval.

I now wish to call your attention, more for the purpose of discussion than any other, to a subject which although not new to any of us, I believe all to be interested in,—it is the “Conservative Treatment of the Dental Pulp.”

Two years ago, at a meeting held here, it was stated by several present, that they believed when a pulp had become exposed from caries, the best treatment was devitalization, most pulps conservatively treated, died a natural death after a time, and became the cause of trouble and abscess.

While it is very doubtful whether the half century that has been given to the study of the pulp has clearly solved all the problems connected with it, I remember that I was surprised at what I heard, and wondered if it could be possible that the many pulps that I had treated and capped, could many of them now be causing trouble, and the rest almost sure to.

I went home with the determination to know beyond a doubt if this were true, and since that time I have carefully watched those pulps capped before and since that have come under my observation, and I have yet to find that a large proportion of them are not doing good service, and respond to thermal change.

I do not believe that my treatment differs materially from that of you gentlemen, or the generally accepted practice, but I do believe that I saw 85 to 95 per cent. of pulps capped where systemic conditions are favourable.

I speak of this now that the subject may be brought up, and I would like to learn if the gentlemen who expressed themselves upon the subject two years ago, adhere to the same opinion still, and that a general discussion may follow.

NEGLECT OF MECHANICAL DENTISTRY.

By J. E. CUMMINGS, D.D.S., M.D.S., Syracuse, N.Y.

The subject of this paper is one that should be of great interest to each and every one of us. Webster tells us neglect means :—not to treat with due attention, to suffer to pass unimproved, unheeded, to disregard or to slight, &c.

This word neglect now seems to be in great prominence in regard to Mechanical Dentistry. Why should there be this state of affairs? We are ever asking for a higher standard in our profession, why should it not affect the mechanical part of our work as well as the parts of operative and surgical? Let us ask a few questions, as the old adage tells us what is not worth asking for is not worth having, and if we can get this help by asking it certainly will pay us to speak; perchance some may be able to show new light on the subject.

1st. Have we reached that point in our history when artificial dentures are not needed? No; and probably as long as the world moves there will still be a demand for artificial substitutes and dentists of mechanical skill are expected to furnish the same. There has heretofore been too short a time spent in college, or in office preparatory to attending college, consequently the few months have been crowded with them and but little attention paid to practical mechanical dentistry.

2nd. Do we save all the teeth that come under our care? We may say yes, or we do our utmost to that end, but time is our best judge, and this should be our one aim in professional work.

3rd. Do we find it the best course to pursue to refuse to extract in all cases? This question can also be answered no, to a certain extent, as in a subject who may present himself with the teeth in the last stages of pyorrhœa, or from root absorption of any one or more of the teeth, or from patients who have never given the teeth any attention, and we find them in a badly decayed or broken condition, these are a few of the cases where it may not be the best plan to refuse to extract.

* Read at the Fifth District Dental Society of New York, Utica, N.Y., April 8th and 9th, 1890.

4th. Are all our patients prepared to give the required time and expense to the salvation of the natural organs? All are not blessed with means sufficient to have the work done regardless of expense, say nothing of the time required to accomplish work of this character. What are we then to do? Are we to refuse to work for them, and by so doing compel them to visit the charlatans of our profession, which act alone encourages workmen of this sort, who seem to grow in number and flourish under our very eyes, without molestation from the law. Some may say in regard to mechanical dentistry "We have advanced in the science of our methods and are not called upon to do this class of work." Then, if we have taken that step of advancement, why do so many of our preceptors require of the young men entering their offices to spend most of their valued time in the laboratory, where little but this kind of work is done? Why not give the young men more time in studying the best methods of treating, filling, &c., that they may better prepare themselves to battle with some of the difficult cases that will be sure to fall to their lot in later years. There are now but few dentists practising in this country who do not make some claim to do mechanical work in their offices. There are still fewer, who do mechanical to the exclusion of all other work, but you will find in most of the former class the work is entrusted to men of little or no mechanical skill, or wholly to students; while in the latter class, it is done by men of reputation, either local or general, or else is performed by the proprietor of such offices, showing where the work is worth doing it is worth doing well, and can be done to the highest state of perfection. This work calls for our best skill in a mechanical point of view, and we should never fail to encourage those who intend entering the profession to improve all the golden opportunities to acquaint themselves with the real practical part of mechanical work.

British Journal of Dental Science.

LONDON, JUNE 16th, 1890.

CONTROL OF THE HOSPITAL STAFF.

IN one or other capacity the majority of the public are interested in Hospitals. As a member of the staff, as a student, or as a relative of these ; as a Governor, as a subscriber, or as a patient, each has some tie which links him, however loosely, to these institutions. The evidence, therefore, before the Select Committee on Hospitals will be read with attention, and the Report, which will be issued at its close, cannot but be looked forward to with interest. Already many very interesting questions have been raised ; there is the question of Special Hospitals, the opening the Infirmaries for teaching purposes ; the establishment of Out-patient Dispensaries ; the transference to these and to the Infirmaries of the majority of the Out-patients and the constitution at the Hospital of simply a Consultative Out-patient Department ; the redistribution and rebuilding of the Hospitals, so that each one shall meet the wants of a metropolitan district ; the question of rating these charities ; these and many others, which have been raised, are points of vital importance to the future medical aid of the poor. Discussion on all these points cannot but be of service in elucidating the questions, but we may safely look forward to the report of the noble lords, as being a thoroughly practical one, given by a body of men untrammelled by preconceived or precontracted notions and one thoroughly in keeping with these later day ideas. On one question, however, namely, the control of the hospitals but more especially of the Staff, by some central authority,

there seem to us, some views which may possibly not be brought before the committee and of which it may not be cognizant. The evidence given by Mr. Bousfield, and the letter to the *Lancet* of Dr. Lionel Beale, by way of a reply, have more especially brought the control of the Staff into prominence. The opinion of the former is, that "it would be better if the control over the medical staff were stricter;" whereas, the latter writes, 'so far from the influence, authority, and freedom, from lay interference being diminished, every effort should be made to increase these in all medical institutions, for it is quite certain that if the several medical staffs were brought under stricter control, and arbitrarily organised into dismal uniformity, the progress so marked in every one of our hospitals would soon cease, and decadence would prevail." We do not wish to refer further to professional aspect of the question, but we would ask, would a continuance of the present reliance of the Hospitals on voluntary aid be possible, if once the staff cease to be the heads of the Hospital, as they now are, and instead become servants, important ones, no doubt, but still servants? This question raises another, it is, how are the enormous sums which go to support these institutions, brought together year by year? We believe that a very large proportion of them is given chiefly through the direct or indirect influence of the Staff. The sources of a hospital's income are of course many and curious. The announcement that the proceeds are about to be given to a hospital is not a bad advertisement for many an amateur performance, which otherwise might, possibly, be given to empty benches. One of the progenitors of the Royal Academy, more generous than its descendant, devoted its funds to the relief of the "distressed and decayed brethren," and in an erratic and perfectly incomprehensible way of helping these handed its first earnings over to the Middlesex Hospital! the Lying-in Hospital!! and the Asylum of Female Orphans!!! Be this as it may, the larger part of a Hospital's income is made up of subscriptions, donations and legacies, and though these may, in some instances, be given from very curious motives, we take it, that usually they are given because the donor takes a real interest in the charity. Now we believe, that in the majority of cases this

interest has been sown by and then developed under the fostering care of the medical attendant. Look down the lists of donations, &c., in the Annual Report and you will see how many are given through some member of the Staff. Certainly this is very true as regards our own Dental Hospitals. Now, we ask, will this work for the Hospital be continued if the position of the Staff be lowered? We think not. If from feeling he is absolutely supreme, that he is followed by a band of admiring students to whom he is, or imagines he is, a kind of Greek god on a pedestal, we say, if instead of this he is chaffing at some new rule or regulation from the controlling authority, we ask is it likely that he will feel the same desire to push the interest of the Hospital among his friends and patients?

IN a recent issue we mentioned in our News column the fact that the Government of Germany intended to interdict the carrying of an American doctor's degree. Apropos of this, Mr. B. H. Catching writes to *The Dental Register*—"I see Germany is playing havoc with the American degree. They must compare it to the American hog, which was knocked out of that empire some years ago. Chicago must go the whole hog or none. She has fifteen dental colleges, each with a dean and a corps of professors. She packs more hogs and issues more diplomas than any city in America, Germany must have a spite against Chicago, and Herod-like, sweep the whole country to get the right ones. You know, doctor, all our schools are first-class, all belong to the College Association, all issue diplomas on merit, caring nothing for the number of matriculates or the money; just doing it for glory."—We are sorry things should be as here stated, but speaking the truth straight out, (as Dr. Catching does) will, no doubt greatly assist in urging on their rectification.

"LITTLE beginnings make big endings." We could not help being reminded of the first Dinner of the Dental Hospital of London Athletic Club, when, on Saturday, May 31st,

for the first time a sufficiently numerous company was present to fill the Venetian Saloon at the Holborn Restaurant. This first dinner was held at Ashley's Hotel, Covent Garden, and was quite a free and easy, informal kind of affair. This year's resembled it in being more a students' Dinner than many of its predecessors have been. This is as it should be. The toast of the evening, "The Club," was proposed by the Chairman, Mr. J. Smith Turner, in one of his usual comprehensive speeches. He reviewed the history of athletics from the time of the Greeks to the present day, not forgetting a reference to our first parents, and described its various developments to-day, from the games of the street boy upwards. There were also the usual poetical quotations. Needless to say the toast was drunk with enthusiasm.

THE best speech of the evening was that of the Secretary of the Cambridge Athletic Union, Mr. Richard Turner, who, as the son of a "Dental," was peculiarly welcome. His delivery was perhaps a little laboured, but his matter was excellent, and not being too profound was admirably suited for those who had only just dined. There had been some dispute as to who was the parent (we say parent since the sex seems doubtful), of the Athletic Club, for several claimed it as their child, a not uncommon occurrence when the child happens to be successful. Apropos of this, Mr. Turner made one of his happiest points. He is reading for the bar, so he promised "when I have a seat upon the bench I shall be happy to make an affiliation order as to the ownership of the child." Lawyers, with characteristic humility, are always happy to settle everything for anybody. For ourselves we wish Mr. Turner a more comfortable seat than a "bench," why not a "woolsack"?

THE "Zahntechnische Reform" in a recent issue, called upon its readers to raise their standard of fees. It draws attention to the fact that platinum has risen to the price of gold, that india-rubber has advanced in price 10. to 20 per cent.

and that the various movements in the labour market will soon put an end to Germany being regarded as a cheap country. It recognizes the fact that young beginners, having to battle with many worries, are tempted to accept work at a remuneration, for which it is almost a sin to work, rather than refuse it. These hope, ultimately, to raise their fees, but it warns them, they will find this almost impossible. It counsels those who understand their art, who will not, therefore, always remain a bungler or require long years of self-teaching, to struggle on for a year or two, since in the end they will feather their nest far better by taking a firm stand on the fee question, than by simply taking what they can get. "People deceive themselves regarding the expenses of our profession. Of course, he who reckons how little a tooth has cost him, will think two or three shillings enough to ask his patient. But he ignores the fact that we are not tradesfolk ; that the instruments, &c. forming our "outfit" are relatively expensive, and that in the course of a year we require quite an astonishing amount of material, and in addition are required to keep on hand a number of teeth which we may never require, or at best, after a long interval. He forgets also, that we are obliged to live in a more expensive neighbourhood and in a larger house that would be required by the family."

IN connection with the above mentioned rise in price of rubber, it is interesting and comforting to learn that 15,000,000 india-rubber trees have been planted in the state of Oaxaca, by the government of Mexico.

Abstracts of British & Foreign Journals.

DENTAL COSMOS.

COPPER AMALGAM, ITS VIRTUES AND ITS VICES.

The following decided advantages over other amalgams have been claimed for copper amalgam.

1. It changes its form during the process of crystallisation or hardening to a less degree than did other plastic metallic compounds, neither expanding nor contracting to an appreciable extent, and having little or no tendency to assume a spheroidal form.

2. While usually quickly changing colour upon its exposed surface, in many cases becoming absolutely black, it did not discolour or stain the tissue of the teeth, the only change in the colour of the tooth produced by its presence being that due to the translucency of the tooth-tissue.

3. That it was a better tooth-preservative than any other metallic filling in that, in addition to the protection afforded by its making a perfectly-fitting filling, it possessed an antiseptic property that of itself prevented the recurrence of decay.

4. That it was permanent.

These claims were decidedly taking, especially as they were strongly and well indorsed. So slowly do the vices of this compound develop, that although using it largely it was several years before I had reason to question them; indeed, that I could hardly realize that the deficiencies noticed were inherent in the compound and not due to accidental or avoidable causes.

I wish to explicitly state that the material under consideration is the amalgam made by uniting under suitable conditions finely divided copper and mercury. My remarks have no reference whatever to the amalgams of which copper is a component part of an alloy to which mercury is added immediately before being used. This explanation is necessary, as the latter is occasionally advertised and referred to as "copper amalgam." To avoid confusion the term "copper amalgam" should be restricted closely to the amalgam containing copper and mercury only, an amalgam that is peculiar and distinctive, and has little in common with the amalgamated alloys.

The first claim I fully concede : it is a distinctive characteristic of copper amalgam and constitutes its chief virtue. The expansion and contraction and the hardness of the amalgamated alloys depend greatly upon the proportion of mercury they contain : a very little more than enough seriously impairs their usefulness. I have long been impressed that the imperfect edges of amalgam fillings otherwise in excellent order are due, in many cases, to the amalgam in immediate contact with the walls of the cavity containing an excess of mercury, the process of packing it into the cavity naturally forcing the surplus to this portion of the filling, forming in immediate contact with the walls of the cavity a layer of amalgam containing so much mercury, that it not only contracts in hardening but it never becomes as hard as that in the central portion of the filling.

An excess of surplus of mercury in an amalgam is necessary to render it practically workable, the amount of this excess, or surplus that may be permitted to remain without impairing the usefulness of the amalgam, being determined by the metal or alloy combined with the mercury, but it forms the unstable and changing element with which we have to deal, and has much to do with the variable behaviour of amalgam and amalgam fillings. It is only when the excess becomes excessive that it becomes objectionable. The filling may contain no more than a permissible excess of mercury, and yet it may by its unequal distribution seriously impair the usefulness of the filling. To a certain extent the mercury tends after the filling is completed to "soak" through the mass and to correct this ; this tendency is much more limited in the amalgamated alloys than in the copper amalgam. Copper amalgam, in the condition in which it should be used for filling teeth, takes up mercury with so great an avidity that I question if it would be possible to make a filling, however large, that was not in this respect homogenous. Again, within wide limits the proportion of mercury seems to have no appreciable effect upon its hardness, or its contraction or expansion,—indeed, not until the excess of mercury is so great as to render it too soft and plastic to retain its form. The combination of these two properties, in my judgment, is the only real virtue possessed by copper amalgam. Except that it requires a longer time to harden and the risk that it may receive injury before the hardening process is complete, a filling in all respects as good may be made with copper amalgam containing enough mercury to render it sufficiently plastic to work kindly as with

the same amalgam from which the excess of mercury has been so completely expelled that the mass is in a barely workable condition.

The second claim I decidedly dispute. Discolouration of teeth by copper amalgam, is only a question of time. It does stain tooth-tissue, and is quite as, if not more, objectionable in this respect than most of the amalgamated alloys. Especially is this the case when it is combined with other filling-material. In a number of cases in which I have used it in combination with gold, the copper amalgam being first inserted and allowed to harden, the teeth have been stained a peculiar gray-green throughout their entire substance, the colour extending far beyond the tissue in immediate contact with the copper amalgam portion of the filling. A lining of zinc phosphate cement has proved but little protection. It does not always stain the teeth, but, in several instances teeth that I examined and found unchanged in colour two or three years after the filling were inserted and so noted, are now, after an interval of a few more years, badly stained, presenting an appearance very similar to that produced by the coin or precipitated silver amalgam of half a century ago. In most cases the exposed surface of the filling becomes quite black, in some cases a light gray colour, only, and in a few it remains clean and bright. I have not found, however, any relation between this and the discolouration of the teeth; nor do I find the discolouration due to the translucency of the tooth-tissue. It is a real, absolute, permanent, and penetrating stain.

In regard to the third claim, I am not convinced that copper amalgam has any greater tendency to retard or prevent the recurrence of decay than any other material that makes an equally tight filling. In my judgement its anti-septic properties have not, practically, the slightest value.

The fourth claim, its durability, it is fairly entitled to. No filling material with which I am acquainted be considered permanent; apart from its being released by recurring decay, or forcibly dislodged, each material has its own peculiar weak points. Gold, however carefully impacted, may disintegrate either from unappreciated defective manipulation or the peculiar forces brought to bear upon the finished filling; the cements undergo chemical solution, gutta-percha and its allies mechanical abrasion, and copper amalgam also has its own peculiar distinctive failings. How far these may be due to unappreciated, undiscovered, and possibly avoidable causes, or how far they are inherent in the material itself, I am unable

at this time to determine. I have noted first a gradual wearing away, the filling after a time presenting very much the appearance of a gutta-percha or cement filling partly worn out. This is not due to attrition, nor to any want of hardness in the filling, but is, I think, a chemical solution. It has been noted that those copper amalgam fillings that quickly turn black are not liable to this change, but only those which retain their colour or are discoloured but slightly. This accords with my own experience. It has been suggested that this may form a reliable rule to determine whether copper amalgam is suited to the mouth or not. If it retains its colour, its use in that mouth is contra-indicated. This is probably a fairly safe rule ; it is not, however, infallible.

I have found that some fillings that do turn black after a few years disintegrate and break up ; why, I do not know. It may be, however, that during the excessively long time required for copper amalgam to harden it is, in localities especially exposed, injured by the pressure of the tongue as it instinctively seeks those points that do not feel quite natural or by the fingers or toothpick of inquisitive patients, or the pressure of food in mastication, etc. ; these may, and doubtless do quite frequently, injure the filling, and at some stage of the hardening process may completely ruin it. I am unable at this time to present a more plausible explanation. I have especially noticed it where the copper amalgam has been used to patch an alloy amalgam filling, or where it has been in contact with one, the two amalgams not having been inserted at the same time. If the two amalgams are inserted in a cavity at the same time, the alloy amalgam will not harden. This has been questioned. It requires but a single experiment to settle the matter beyond all cavil.

In conclusion, I consider copper amalgam judiciously used a valuable addition to our list of tooth-filling materials. For the masticating surfaces of children's first teeth, cavities difficult of access, or where on any account a very plastic material is desired, it has decided advantages. I have found it useful to cover the masticating surfaces of badly pitted newly erupted first molars ; it enters into and takes firm hold of the little crevices, so that with little or no excavating the surface may be protected until the tooth is matured. It is also valuable as a capping in deep cavities where the pulp is nearly exposed ; it may be used in such case in so plastic a condition that practically no pressure is required to adapt it to place ; it is non-irritant, and becomes in a few days sufficiently hard

to protect the tender spots from undue pressure when the filling is inserted. In many places and for many uses it has decided advantages. It does not, however, supplant the alloy amalgams. I am disposed to think that in the long run those who use it most cautiously will appreciate it most highly.

CRYSTALLINE GOLD VS. FOILS.

By JAMES LESLIE, D.D.S., Cincinnati, Ohio.]

Fifty years since I introduced cohesive gold foil to the dental profession, and although it was condemned by many of the comparatively few dentists in practice at that time, it has been gradually adopted, and to-day in the practice of the majority stands in the front rank of materials for filling teeth when gold is required, either for the entire filling, consolidation, or for giving a hard surface to a non-cohesive gold filling. I have the kindest feeling for it and other foils as such, but believe that they have not all the properties of the royal metal that may be available for dental purposes.

For some years back I have worked in my laboratory trying to discover some form of gold that might be better even than foils, or at least be a valuable addition to them.

It occurred to me, and the thought is the question of this paper. What is the structural and working difference between gold foil and an entirely new product and new form of gold which I have discovered as the result of many experiments, and which I term crystalline gold? This question I shall try to answer. It is at least partially prerequisite to an understanding of my theory, that the reader should be familiar with the fact that when gold is melted and poured in an ingot it immediately forms a dense mass which has a crystalline structure, readily seen on breaking the ingot. The next process in the manufacture of gold foil is the laminating or rolling of this ingot to a required thickness, during which this crystalline structure is largely destroyed; and when beaten into foil I think it may be said that it is entirely so, as under the microscope the crystalline form that was distinctly seen with the naked eye in the broken ingot, cannot be seen in foils.

The ingot when rolled out into a ribbon has become fibrous

and by further extending it into foil its fibrosity is largely increased ; but if not extended more than four grains to the sheet, it still has firmness of continuity that renders it suitable for filling cavities of teeth. These qualities of *continuity and cohesion combined in foils* are just the characteristics in view of which I now proceed to explain the theory, which has resulted in my suggesting that the crystalline structure of my new form of gold is much better adapted to the irregular surface of the dentine than the continuous and bright metallic surface of cohesive or non-cohesive foils.

In filling a cavity with cohesive gold foil the dentist locates a pellet of gold in a retaining-point, and it is firm, and beyond the jar of the mallet or hard pressure ; when he attaches another pellet it coheres to the retaining-plug, and so with the remaining pellets until the filling is complete. But often in the process, as he passes away from the retaining-point in building up and condensing the foil about the walls, the half-finished filling has been noticed to move. The grip on the dentine it is his delight to see is wanting, the filling is loose, and he wonders why he loosened it, but the anchorage is still quite firm. Now may it not be that the bright, solid, fibrous, and continuous metallic surface of the foils is the reason why the failure occurred ? From my practical experience and experiments with my crystalline gold I find it is entirely free from any such faults in filling, and there must be a reason for this striking difference of behaviour by a different form of the same metal on the same dentine surface.

The following suggestions may help to an understanding of this marked difference between the working of foils and crystalline substances in filling teeth.

I have stated that the crystalline structure has been destroyed in the manufacture of foils, and remark now that each pellet of foil is of one entire piece, crimped or folded, and when the gold is malleted or pressed home there is an intimate molecular connection throughout this solidified mass. If the pellet was one-eighth inch long or more, there was a close union before the operator began to condense, and he has simply malleted or pressed the air from between the folds or interstices of the pellet of foil ; but owing to the continuous connection of the gold, some taps at one end of the pellet may jar just enough to weaken the close fitting at the other end ; and this may be the real cause of some failures in filling, and why gold "rocks and balls" and leaks.

It is here that the marked difference and behaviour of crystalline forms of metallic and mineral materials for filling teeth appears. My crystalline gold is not a continuous body held together and made as are foils, but is a distant crystallization, each crystal slightly cohering being free to move just at the immediate point of the plugger, imbedding itself closely in the dentine without dragging its adjoining crystal, as it also is free to move only as force is applied directly to it, and is then not subject to the adjoining taps as are foils that are in a continuous and fibrous mass.

This important discrimination, which I have made as to the behaviour of the same metal under different conditions, may be, and I think is, entirely new to the profession; but my theory is not mere speculation, for it is demonstrable in practice, and may be illustrated by the analogous behaviour of amalgams. The reason why amalgams are easy to locate in and fill cavities with is because they have a granular form produced by filling. The fillings may be coarse or fine, resembling the gold crystalline structure in size, though not in form. When mixed with mercury they are held together by being made "wet" by that liquid metal, just as materials for making bricks are held together by moisture and solidified by heat. There is nothing in mercury or the other metals of which amalgams are composed that has any affinity for dentine.

Then why does an amalgam filling adhere in many cavities from which any other metallic filling would drop? Simply because the density of the mercury and its affinity for the amalgam or some of its component parts, when under pressure, *expels and keeps out the air more perfectly than any other form of liquid*; but the granular structure of the fillings under pressure not being of a continuous and fibrous form like foils, the most obscure inequalities of the dentinal surface are reached and gripped since the granules, though bathed with mercury, are still free to move in any direction, and when a part is pressed home the adjoining granules when pressed upon do not drag the others out of position: and so long as the mass remains "wet" or moist with the mercury the adaptation and adherence for a time is perfect,—the mass solidifies, and such fillings remain where no other metallic filling could be made to cling. It is quite common for dentists, when speaking and writing of the changes that an amalgam filling has undergone, to declare that they are owing to the process of "crystallization" under chemical and mole-

cular laws ; but they forget or are ignorant of the fact that a solution of all mineral and metallic substances by water, acids or heat must be obtained before there can be true crystallization. When picking out an amalgam filling, it is not crystals that are picked out, but the same fillings that had been mixed with mercury (resembling burned brick, which is the same clay and sand in grains large or small as they came from the workman's hand, though bruised in mixing). What a nice, clean, and easy process it would be if we could take bars of silver, tin, and platinum, and dissolve them by adding mercury to produce a chemical solution that might result in a perfect crystallization ; but, as this cannot be done, an amalgam filling is only a solidified mass with some part of the mercury absorbed and wanting,—may be its caloric gone, or some yet undiscovered element that passes off, yet keeps it as a liquid when alone, but will not effect a crystallization.

When my new form of crystalline gold is examined, there will be seen distinct crystals entirely different from any form or precipitates of gold I have yet seen or with which experts are familiar. Under the microscope the remarkable distinction between a simple precipitate and a crystal is distinctly seen, as it has the peculiarly-defined forms that are due to the recognized laws of crystallography. When used in filling cavities, its crystalline structure is the only reason I can assign why it seems to grip the dentine and *never moves as the filling progresses after a small* retaining-point or groove has been made.

Years may yet elapse before the theory herein put forth shall find general acceptance by the dental profession, but to my mind it has long been clear as daylight that indisputable facts concur with scientific principles in affirming the especial adaptation of my crystalline gold to retention by a closer attachment to the structural irregularities of the interior surfaces of dental cavities than any other form of gold.

DENTAL REGISTER.**EARLY DENTISTRY.**

Dr. J. A. ROBINSON, Jacksonville, Michigan.

THE first set of artificial teeth I ever saw was worn by Dr. Baker himself. They were made of calf's teeth and the teeth of sheep fastened on a piece of thick leather, and worn under the upper and under lips, and were only worn for show and taken out of the mouth while eating. He also made some sections of six or eight front teeth out of bone that were tied in with ligatures to the back teeth. A thighbone of an ox was boiled and scraped, and a section sawed off about the length of the natural teeth and of the size to fill the place of the missing teeth, and tied it in with a silk cord, after being filed down into sections to resemble the teeth. About a year after Dr. Baker's visit to Concord came a Dr. Dewar, of Boston, a French dentist, and he brought with him human teeth, said to have been taken from the battlefield of Waterloo and preserved in alcohol, and set them on the roots with a wooden pin or dowel. This was about A.D. 1828. There were no dental instruments to be bought, and, of course, they were all home-made, by the blacksmith, or some general tinker who makes everything in a small town. As I had poor teeth for a boy, and was something of an expert in the use of tools, having learned to make the wheels and pinions of watches and to temper steel, I was employed to manufacture Dr. Dewar's dental instruments, or tools, as they were called at that time. I got shoemaker's awls to make the small excavators, pluggers and burrs, and put them into ivory or wooden handles, and made a sort of outfit for Dr. Dewar in that way, and he filled my teeth for doing the work. I spent a good deal of time with Dr. Dewar, and saw a good many human teeth on wooden pivots. After Dr. Dewar left Concord, and went back to Boston, I began to make a few partial sets out of bone, and got some sea horse tusks, as it was finer ivory, and I made several small pieces for the toothless women in the town, that did good service for years. I also made quite a respectable turnkey that I have in my possession to-day. There was no instrument for extracting teeth but a turnkey, and Flagg's forceps were invented and first used about 1832 or 1833, and were not put on sale till 1836. In the financial crisis of 1835 I began dentistry by reading medicine with Dr. George

Mansfield, of Lowell, Massachusetts, who was a pupil of Harwood & Tucker, Hamilton Place, Boston. Mansfield was an M.D., and had not been in practice long at dentistry. The only dental work was Bell on the Teeth.

While with Mansfield we began the manufacture of mineral teeth after the plan of the old Stockton tooth, which was a compound of pipe clay, ground to impalpable powder, and feldspar for the base or body, with enamel of feldspar and a little chalk, and shaded or coloured with titanium for yellow, and cobalt for colouring of blue enamel for the cutting edges of the teeth. These teeth were very strong, but very opaque, and resembled white beans about as nearly as human teeth. It will be unnecessary for me to go all through the series of experiments we made before we found a translucent material to make a tooth fit to be worn. The best material was selected from a pile of paving-stones. It is enough to say that it involved stones out of the street—a small boulder of conglomerate quartz—a good deal of hard labour in grinding, and feldspar—a sort of graphite granite that was vitrified—the material and colouring for the enamel that was ground fine and powdered in lead moulds.

My attainments in carving block work I gained by studying natural models. With an old skull in my hands I sat for hours and hours studying the form, shape and size of the human teeth until I understood the organization, articulation, form and size of each individual tooth of the upper and lower jaws. This was good discipline, for every thing is dual, and we all have to make whatever we desire to make perfect within ourselves first, before we can reproduce it outside of ourselves. So the whittling propensity and practice of my boyhood was useful to me when I wanted to make teeth, or models for moulds to manufacture block work or single teeth. As I began dentistry with a horse and waggon, and travelled from house to house, and from town to town, I was astonished at the amount of secrecy that was demanded of me from my patients. Almost every one exacted a promise from me that I would not let it be known in the neighbourhood that Mrs. or Miss. A or B had a false tooth, or a set of teeth, and even when I settled in Old Salem, Massachusetts, many times, ladies had refused to give me their names for the appointment saying: "Now, please don't mention to any person that I am having any new teeth, for I would not have any one know it for the world." And these same persons would come disguised, or with a thick veil to cover the face, to see the

dentist for fear of being seen, or ask if they could not come in by the back door. In the summer of 1836 I made an upper set of teeth for the mother of Ralph Waldo Emerson, who was a relative of my mother, and I made the *plate* out of a section of ivory I got at a piano factory in Boston. I got an impression in beeswax and filled it with soft putty, dried it thoroughly, and that was the only model I had to make the inside of the plate fit the mouth. I cut out the plate on the inside with chisels and small gouges, and used a pigment of red lead to guide me as to the shape, and the irregularities and depressions ; then I filed down the outside of the plate to about one-quarter of an inch in thickness, and set on the ivory plate ten *human teeth* with wooden dowels, and this plate was worn up to the time of her death, and gave good satisfaction. Of course the fit was very imperfect, but as Dr. Flagg used to say, if the patient could answer questions in monosyllables without the plate coming down into the mouth it was all he could expect.

While going about in the towns in search of business, if I found a patient in a tavern, I made a dental operating chair by standing on one foot and placing the other foot in a chair back of the person, and resting his head against my knee to steady it, while I cleaned and filled his teeth, and if I visited the house to work for the women folks, I sat down on a low cushion and had the persons sit on the floor and place their heads against my left arm for a head rest, while I operated on their teeth.

Sometimes my lady patients would remark that this was "a very awkward and singular position to be placed in" to have their teeth fixed, but as we had no other conveniences, it was made to answer the purpose of the dental chair.

In making partial sets of teeth out of bone or ivory, we paid no attention to the articulation, but left a shoulder on the under side to touch lightly on the lower teeth, and if there were any number of back teeth it was the rule not to have the block of the bone touch the lower teeth at all.

Dental operations at that time were purely mechanical. The only regulation was to extract superfluous teeth and give nature an opportunity to correct herself. It was the Harwood & Tucker plan to extract alternate bicuspid and molars that were badly decayed, to make a good free opening to fill an adjoining tooth, saying that ten to twelve good, sound and healthy teeth were more useful than a full set of artificial teeth, and it was more practical than to try to fill teeth that

were of a doubtful character, and their establishment was the leading dental place in Boston.

As dentistry was purely a mechanical attainment in the beginning, professional etiquette was unknown, and the dental laboratory was a sealed enclosure, a secret place with "*No admittance*" placed over the door.

There were a few men in Boston who visited together and compared notes, and showed samples in the study and improvement of the manufacture of "mineral teeth," but when Dr. Harwood succeeded in producing the best samples he differentiated, as the scientist would say, that is, he refused to divulge his secret, and branched off to himself, and that broke up the institution.

It is a hazardous task to light up the coldness and treatment the country dentist received from those dentists who were well situated in Boston fifty years ago. As I stated before, dentistry was purely mechanical, and the evolution in mechanics is the new method of the old plan that was true. This can be illustrated by the germ of the original pivot-tooth as compared to the Richmond crown, or the dental engine compared to the old method of finishing fillings, or taking impressions in plaster instead of beeswax, so the fit would be perfect enough to dispense with the gold spiral springs for full sets of teeth to keep the upper and lower dentures in place. Difficulties always suggest remedies, a profession grows higher and broader as we grow and improve in intelligence and culture.

DENTAL REVIEW.

DENTISTRY IN JAPAN.

By ATSUSHIKO KATAYAMA. D.D.S., Yokohama, Japan.

DENTAL Science was very poor and scarcely practised till 1873, when Government created a "Dental Board of Examiners," that examines twice yearly.

One of our ancestors in Dentistry was a famous professor of fencing, about five hundred years ago. He himself often felt very inconveniently the lack of a Dental Science. Frequently, while he was teaching, accidents would occur in which

teeth were broken or loosened. Whenever an accident occurred to a person's teeth, the professor operated on them. For instance, if the crown were broken, he made a tooth with a piece of wood or wax temporarily ; if it were a loosened tooth, he extracted it with his thumb ; if a case of hæmorrhage, he stopped the bleeding by pressing his finger on the place until it ceased. At length, he succeeded in making artificial teeth, also in the extraction of teeth and the stoppage of hæmorrhage. Thence he called himself a dentist. Since, there have been many original native dentists.

Their methods were entirely different, from those in civilized countries at the present time. They never filled cavities in teeth nor treated the teeth. They only knew how to extract the teeth and to make artificial plates. When they had a patient who had a bad toothache, they either lanced the gum or put a pellet of cotton saturated with oil of cloves or essence of peppermint into the cavity. If they could not relieve the pain they extracted the tooth.

Sometimes, though seldom, when they met very difficult cases they used a hammer and a wooden stick, which they applied to the tooth and then knocked it out or in. They had a very peculiar method of extracting the deciduous teeth—so peculiar that we have never understood it. The child was given a piece of paper, which it was told to bite or hold firmly with the tooth that was to be extracted. The dentist, standing at a small distance from the child, would ask, "Are you ready?" and when the answer "Yes" came, he would clap his hands and go to the child and let him open his mouth ; then the tooth would drop on the floor with the paper. Nobody has ever ascertained what was used on the paper, but some suppose that they put a very adhesive wax on the paper, or, according to others, a piece of sticky candy was used, because some of the children said the paper tasted sweet. We claim that it must have been a piece of extra adhesive wax, though it is uncertain. The method of making artificial plates was almost the same as that used in civilized countries to-day. They had neither metal nor rubber plates ; only fine wooden plates and they had no porcelain artificial teeth.

They first took impressions with beeswax (without impression tray), and after it had hardened enough to handle, hard wax, or a kind of plaster of Paris, was pounded into the beeswax impression for a model. After getting this model, it was generally painted with some colouring matter, especially red. A carved imitation of the model was then produced (cherry-

wood being considered the best wood) which was put over the painted model ; the paint marked the protruding parts. It was then carved again and again, until the paint marked the whole inside of the wood carving. After this was finished, they were ready to set ivory, wood, bone or marble teeth in the carved wood. Holes were carved on the margin of the wooden plate in which the teeth were set. They did not set more than eight teeth, that is, from the central incisors to the bicusps, silver or gold pins taking the place of the molars.

The teeth were retained in their place by small, strong threads. In a case of "partials" they never made a plate, something like bridge-work was used, tightening it in the mouth by the neighbouring teeth or staying it by gold or silver clasps. They made two kinds of plates—white-teeth plate and black-teeth plate, the former being for men and unmarried women ; the latter was for married women only. It will not be out of place here to tell *why* our Japanese women blackened their teeth after marriage and *how* it was done. The substance with which the teeth are blackened is a solution made by dissolving a piece of iron in an acid. When they apply it to their teeth the substance is first rubbed on with a brush, then a little powdered tannic acid is applied with a brush, and this is repeated until the teeth are thoroughly black.

If a woman has well-developed enamel, it is almost impossible for her to keep her teeth black, but on the contrary, badly-developed enamel retains the colouring matter for several days. The colouring matter adhering to the enamel is entirely dependent upon the good or bad development of the enamel ; therefore, if a woman has well-developed enamel, she uses a diluted solution of acetic or sulphuric acid, which she applies with a brush. This she does first to roughen the surface, after which she proceeds to blacken her teeth ; these operations are repeated until she succeeds.

We do not know exactly when the custom of blackening the teeth began, but we suppose it had its origin in the sixteenth or seventeenth century, when the country was so much disturbed by her civil wars. At that time many of the feudal chiefs of the Emperor were scattered around the country living in obscurity or privacy, and as they were known to be both brave and patriotic, a feeling of dislike crept into the people's hearts against the inactive and *unsoldierly* literary men. The military art was exalted and flourished vigorously.

The women, reflecting the men's opinions, selected the

brave military men for husbands instead of the sedate literary men.

If once married, though the husband immediately died, his wife never married again. Then began the practice of blackening the teeth after marriage: this was the sign that the wife's virtue was sacred to her husband, and an oath against further marriage.

The reason given for blackening the teeth is quite poetical; it appears that teeth once blackened never resume their natural colour, and that woman once married are never unmarried.

This custom is almost entirely unseen now, except among old women. Our Japanese married woman's custom was bad, but it appears to me that the cramped foot of the Chinese woman and the compressed waist of the European woman are fully as bad and much worse for the general health. Our country has distinguished herself by the most complete and rapid revolution of old customs and the adoption of European civilization. No country in the range of history, has in the short space of twenty-five years made such a complete change in *public sentiment, habits and government* without bloodshed.

SIR ANDREW CLARK ON HYPNOTISM

Sir Andrew Clark is an uncompromising opponent of hypnotism. It is a revival, he says, of the old mesmerism, which had its day, and soon fell into desuetude. He predicts the same thing of hypnotism. The impression left upon his mind as to the results was—first, that the phenomena may be referred to simple physiological conditions capable of explanation entirely without the introduction of another person with mysterious power; second, that the range of application in this matter is confined to neurotic people, and is capable of influencing essentially hysterical functional conditions; third that the habitual practice of what is called hypnotism upon women is gravely injurious, both normally and intellectually; and, lastly, he did not believe that any power such as that alleged to be possessed by any particular person out of the profession is a genuine power which can ever be widely used for the benefit of mankind under any conditions which it would be desirable for medical men to adopt.

DIETERICK'S FORMULA FOR EAU DE COLOGNE.

Oil of lavender	...	...	...	...	...	j.
" bergamot	...	...	...	...	...	3iv.
" lemon	...	...	...	...	...	3j.
" rosemary	...	...	...	...	...	3j.
" neroli	...	...	...	...	...	3j.
" cloves	...	...	...	...	...	gtt. 15
" cedar	...	...	...	...	...	3ij.
" orange	...	...	...	...	...	3j.
Orange-flower water	...	...	...	...	...	3j.
Rectified spirit	...	...	...	...	...	Oij.

DR. FARRAR'S RULES FOR REGULATING
TEETH.

1st. The traction must be intermittent and must not exceed certain fixed limits.

2nd. The system of moving teeth with elastic rubber apparatus is unscientific, leads to pain and inflammation, and is dangerous to the future usefulness of the teeth. A properly constructed metallic apparatus operated by screws and nuts, produces happy results without pain or exhaustion.

3rd. If the teeth are moved about $\frac{1}{16}$ of an inch every morning, and the same in the evening, no pain or nervous exhaustion follows.

4th. The tissues will allow the advancement of a tooth at this rate ($\frac{1}{16}$ of an inch) twice in twenty-four hours, the changes being physiological, yet if a much greater pressure be made, the tissue changes will become pathological.

BRITISH MEDICAL.

KOLA NUT.

A GOOD deal of exaggeration is observable just now in statements afloat concerning the kola nut, which has recently been attracting a good deal of attention. Europeans, who have lived in Africa, agree in ascribing to it wonderful

sustaining properties during fatigue and abstinence from food. How far it is capable of rendering real service in this way can be deduced from a consideration of what we already know regarding its chemical composition and the action of its active principles. The so-called nut is in reality the seed of the cola (*sterculia*) *acuminata*, a tree over thirty feet high growing in tropical Africa, each fruit of which contains from six to twelve seeds about the size of chestnuts. It has properties similar to coffee and cocoa. The chief active principals are caffeine, of which there is about $2\frac{1}{2}$ per cent., theobromine 0.02 per cent., and tannin $1\frac{1}{2}$ per cent., in addition to starch, cellulose, and the other ordinary constituents of seeds. It forms a large article of inland trade in Central and Northern Africa, the Soudan, Tripoli, Morocco, Senegambia, Gaboon, Angola, on the Congo it is known as makasso, and in the Soudan as guru, while foreigners have sometimes designated it Soudan coffee. When fresh the taste is aromatic, but when old and too dry an unpleasant bitterness becomes developed. To keep them in good condition during transport the seeds are packed with moist leaves. It has been known to Europeans for a long time, and was first described at length in the sixteenth century.

“BOGUS DIPLOMA MANUFACTORIES OF THE UNITED STATES.”

Dr. De Witt C. Newman writes to *The Lancet* :—That the large number of American students always to be found in England and on the Continent may be put in a proper light, and not be made to suffer additional indignities by the action of the University of Berlin, I beg space to reply to your article on the 19th ult., entitled “Bogus Diploma Manufactories of the U.S.

In 1889, forty-eight of our colleges required three or more courses of lectures, and 114 required an entrance examination; of these, at least twelve require an entrance examination equal to the preliminary examinations of the Examining Boards of Great Britain, and none of these twelve have less than a three-years' graded course of study. They are Harvard, Yale, the University of Pennsylvania, University of Minnesota, University of California, College of Physicians and Surgeons in the City of New York (Medical Department

of Columbia College), Albany Medical College (Medical Department of Union University), Niagara University, Chicago Medical College, Cooper Medical College, Saint Louis Medical College, and the Minneapolis College of Physicians and Surgeons. While some of these are comparatively young Colleges, others are old and well known, and all have faculties that have the entire confidence of the profession. We think it as unjust for men holding such diplomas to be denied recognition in Berlin of their time of study because a great many Germans obtained bogus American diplomas, as you think it unjust of France to refuse to recognize your best M.D.'s and fellowships because a few years ago some of the licences were comparatively easy to obtain. We deny that European boards cannot tell the difference between our genuine and bogus diplomas. The Annual Report of the Illinois State Board of Health gives each year the names, time of charter, requirements for graduation, &c., of every college, genuine or fraudulent, existing now, or that ever did exist, in the United States and Canada. By referring to it, it will be seen that the Buchanan and other bogus Colleges were closed by legal process, disproving the statement made by Mr. Martin that "similar deficiencies exist in other States," from which you were led to believe that seven or more persons could charter a College of any kind anywhere in the United States.

Reports of Societies.

THE STUDENTS' SOCIETY OF THE NATIONAL DENTAL HOSPITAL.

THE last ordinary meeting of this Society was held on Friday, May 9th, at 8 p.m. P. W. Grutham, Esq., President, in the Chair. Miss H. Brierly, Dr. William Hill, and Mr. Warren were present as visitors, and received the usual form of welcome from the President.

The minutes of the previous meeting were read by the Secretary and confirmed.

CASUAL COMMUNICATIONS.

MR. BASCOMBE showed two upper bicuspid teeth taken from the same mouth, each one having three well marked roots.

Mr. S. SPOKES mentioned a case of epithelioma. The patient came to the Hospital for the purpose of having some decayed teeth removed. On examining the mouth he was found to be suffering from epithelioma. He at once went to the Middlesex Hospital, where he was placed under treatment. The case, however, is said to be hopeless.

MR. CLEMENTS showed the model of an upper jaw, having a supernumerary incisors behind the permanent centrals, they were well marked.

MR. W. J. FISH mentioned the following case :—A lad æt. 15 years, came to the Hospital to have a right upper 2nd molar removed, but on attempting to remove it, the dresser found that the bone moved with the tooth. Mr. Roughton, who saw the patient afterwards at St. Mary's Hospital, advised the removal of the bone. This was done, and the wound has healed satisfactorily.

THE PRESIDENT then called on Dr. Williams Hill, B.Sc., Lond., for his paper on "The Interdependence of Rhinopharyngeal and Dental Disease." (See page 529). After which a discussion took place. The Dean in the course of his remarks, thanked Dr. Hill for honouring the Society with his presence, and for his highly scientific paper.

Messrs. Fish, More, Spokes, Timms, and the President also took part in the discussion. And Dr. Hill having replied, a hearty vote of thanks was unanimously accorded him for his most able and interesting paper. The meeting then adjourned until June 6th.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE usual Monthly Meeting of the above Society was held at the Victoria Dental Hospital, Grosvenor Street, All Saints, on Tuesday evening, April 1st, 1890. Mr. W. Headridge, President, in the chair.

CASUAL COMMUNICATIONS.

Steel Retaining Screw.

MR. SIMMS said that at a previous meeting he had spoken of the use of Steel Screws for retaining fillings in badly decayed teeth. He had since found out that by the aid of a magnetised screw-driver, these small screws were readily and expeditiously carried to the hole drilled for their reception in the tooth. The screw-driver was readily magnetised by rubbing on a magnet.

Dilacerated Teeth.

MR. COLLETT showed two specimens of dilacerated teeth ; a left lower lateral and an upper left bicuspid. They were both extracted from the mouth of the same patient.

An Engine Mandril.

MR. WHITTAKER showed an Engine Mandril, which he had made an inch longer than the usual size for holding the small brushes, &c., used in polishing teeth and fillings. The extra length of mandril prevented the saliva running in the handpiece, as so frequently occurred with the shorter mandril.

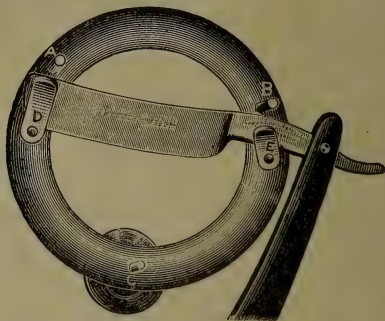
How to construct an inexpensive Microtome.

MR. W. SMITHARD read the following communication on the construction of an inexpensive Microtome, and which we are enabled to illustrate by the accompanying drawings.

"A simple and inexpensive Microtome may be constructed, having an ordinary razor for a cutter and a wooden curtain ring as the carrier.

The ring should be about 4 inches in diameter.

From the under surface of the ring drill three holes $\frac{1}{8}$ in. in diameter (Fig. 1, A, B, C.) at equal distances from each other ; the hole at C to go through, and at A and B nearly through the ring.



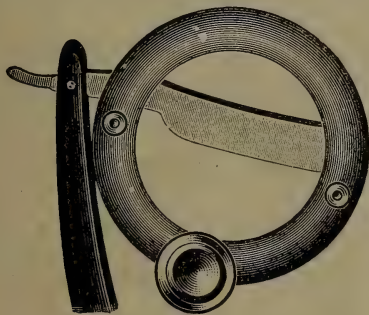
Between A and C, and B and C, drill the holes D and E through, and one inch from A and B.

Now take four pieces of steel $1\frac{1}{4}$ in. in length, and $\frac{1}{8}$ in. in thickness, on one end of each piece run a thread for $\frac{1}{2}$ inch. Two of these rods or pins may be screwed into the holes A and B, leaving $\frac{3}{4}$ in. projecting. To each of the remaining $1\frac{1}{4}$ in. pins rivet a strip of brass $\frac{3}{8}$ in. in width by 1 in. in

length, pass these pins through the holes D and E, and having turned two brass milled nuts, screw on and so form clamps to hold the cutter (razor); the under surface of the ring between these points and A and B must be excavated to receive the blade of the razor, so as to keep it horizontal and to allow it to be securely clamped.

Now take a fifth piece of the $\frac{1}{8}$ rod, 2-in. in length, and run a thread the whole length (say 36 to inch guage); having rivetted to this a head, one inch in diameter, with milled edge turned from a brass disc $\frac{3}{16}$ inch thick, screw it in the hole C.

A sheet of plate glass 10×10 ins., having a holder (for imbedded substances) secured to it in the centre, should be used to slide the instrument over, in section cutting. The cutting edge of the razor is directed towards the regulating screw C, the thickness of the sections is regulated by a turn of the screw C; the disc forming the head might with advantage be marked to denote the fraction of revolution of the screw.



In cutting, the instrument should make somewhat of a circular sweep."

Continuous Gum Work.

Mr. E. HOUGHTON made some introductory remarks on the subject of "Continuous Gum Work," prior to his practical demonstration. He said that one of the difficulties to be overcome in Continuous Gum Work, was the liability of the platinum base plate to warp in the furnace. To obviate this, it was his practice to put a stay of platinum wire between the extreme points of the plate, and secured to the plate by means of plaster and asbestos. The fracture of a tooth or a

portion of the continuous gum was a very rare thing, and by the system of removable facings, presented no unusual difficulty in repairing. In regard to the materials used for the gum work, Mr. Houghton said they had two excellent bodies in White's and Tees; the latter had the advantage of fusing at a lower temperature, but White's material probably was a more satisfactory colour. It was most important that the process of cooling the finished piece should be prolonged as long as possible and this Mr. Houghton was able to do by the use of a Jacket made by lining a tin box with asbestos sheeting, and placing over the furnace after the enamel had been fired. By this means the cooling could be prolonged to about six hours.

In answer to an enquiry, Mr. Houghton said he used White's teeth, as English teeth would not bear the requisite heat.

Dr. SHAW said he had a specimen of Vulcanite and Continuous Gum Work made in the year 1859. For some years he made a number of these cases, and he had been surprised at the small number of breakages which had occurred in the vulcanising.

Mr. E. HOUGHTON then exhibited specimens of Continuous Gum Work in various stages of manufacture; some specimens combined with vulcanite, and several in connection with a base plate of gold. The method of fixing the gum facing was essentially the same in each case, viz., by gold screws passing from the under surface of the base plate into the platinum at this point being made thick enough to allow the platinum plate of the Gum Work, sufficient depth for the screw. In the cases where Vulcanite was the base, small pieces of metal plate were imbedded in the vulcanite at the point where the screws were intended to pass through.

DEMONSTRATIONS.

Mr. DOUGAN crowned a left lateral superior incisor, using a Logan crown. The remains of the root were cut down with a circular file turned by the engine, and the root canal which had been previously filled with gutta-percha, was enlarged and cut with fissure burs of the same size and shape as the Logan pattern. The close adaptation of the crown to the end of the root was obtained by interposing between them thin carbonised paper to mark the points of contact.

Before finally forcing the crown into position, the root canal was wiped out with alcohol, and dried by means of a

hot air syringe. Oxyphosphate cement was then placed in the root canal with slightly oiled instruments, and also in the recess of the crown and around the post.

In reply to numerous questions Mr. Dougan said the use of special instruments to shape the root canal was objectionable, as they cut a round hole which weakened the root, and in his opinion the post should fit the root canal closely, and be held almost independently of the cement.

He considered the only advantages of the Logan crown were:—the short time required to set it, and its cheapness; he would prefer a crown made of English mineral on account of its much greater strength.

Mr. E. HOUGHTON fired several pieces of Continuous Gum Work in the furnace designed by Mr. Simms and himself, using a Gasoline generator instead of coal gas, as a fuel. The heat was rapidly and satisfactorily obtained.

Mr. LINNELL had in attendance four patients for whom he had performed the operation of immediate torsion, particulars of which appeared in the last number of the Transactions. By means of Mr. Broughton's Electric Lamp the teeth were especially examined as to the continued vitality of the pulps, and in the opinion of the members present the evidence was quite satisfactory that the pulps in laterals and centrals alike had remained alive.

THE STUDENTS' SOCIETY OF THE VICTORIA DENTAL HOSPITAL, MANCHESTER.

The fifth annual meeting of the above Society was held on Thursday evening, May 22nd. Mr. DAVID HEADRIDGE in the chair.

The minutes of the previous meeting were read and confirmed.

Messrs. F. L. Tanuer and G. Kershaw were admitted as members.

On Casual Communications being called for, Mr. J. E. Lingford presented a model of a lower jaw showing a supplemental canine.

Mr. P. R. Sibson exhibited a well marked case of dilaceration.

The report of the Council which was read by the Secre-

tary, giving a short resumé of the work of the past session was received with much applause.

The treasurer in his report showed a balance to the credit of the Society of £18 9s.

The curator, Mr. D. HEADRIDGE, then read the report of the Library and Museum, showing an appreciable increase in both the number of books and specimens presented.

The following gentlemen were elected as officers for the ensuing session. *President*, G. G. Campion, Esq. *Vice-Presidents*, G. O. Whittaker, Esq., H. C. Smale Esq., P. A. Linnell Esq., C. H. Smale, Esq. *Secretaries*, Mr. P. R. Sibson (re-elected) Mr. J. C. Lingford. *Treasurer*, Mr. D. Headridge (re-elected). *Curator and Librarian*, Mr. J. C. Stokœ. *Councillors*, Messrs. Coogan, Fisher, Sherratt, Stokœ.

Votes of thanks to the chairman and retiring officers brought an interesting meeting to a close.

Dental News.

THE University of Dorpat conferred 131 medical diplomas between September 1st, 1889, and February 1st, 1890. Among these were 16 degrees of Doctor of Medicine ; 31 of *Arzt*, or "medical practitioner;" and 6 of *Kreisarzt*, or "district doctor." The others included 6 licenses as dentist and 7 as midwife, the balance consisting of various diplomas and licenses in pharmacy.

WE regret to read of the death of Mrs. William Harper, wife of a member of the celebrated firm of Harper Brothers, publishers, during an administration of chloroform for dental purposes. Mrs. Harper was a grand-daughter of Henry Ward Beecher, she had only been married a year and leaves an infant only a few weeks old.

It is said, that by way of encouraging French physicians to attend the Berlin Congress, the Government have ordered four military surgeons of high standing, to attend the gathering.

THE Annual Dinner of the Odontological Society of Victoria was held at Parer's Café on the 18th April, and an exceedingly enjoyable reunion was celebrated.

THE Dental Board of Victoria have adopted the *Australasian Journal of Pharmacy* as their official organ. At the present time the journal is supplied to more than three parts of the registered dentists in Victoria. At the meeting of the Board on March 28th, numerous inquiries were received and answered as to the qualifications for registration.

THE COUNCIL ELECTIONS AT THE COLLEGE OF SURGEONS, England.—Mr. Marshall, Mr. Power, and Mr. Croft retire from the Council next July by rotation, having been elected in 1882. None of these members seek re-election. The following candidates intend to offer themselves for election. The dates refer to the year in which each candidate took the Fellowship : Walter Rivington (1863) ; R. Brudenell Carter (1864) ; J. Langton (1865) ; E. Bellamy (1867) ; Marcus Beck (1869) ; W. Mitchell Banks (1869) : Lawson Tait (1871). The election will take place on Thursday, July 3rd.

THE degree of M.D. *hon. causa* will, understands *The British Medical Journal*, be conferred, on June 26th, by Trinity College, Dublin, on Richard Quain, M.D., Lond., F.R.S., and on Mr. John Marshall, F.R.S., President of the General Medical Council.

THIS Journal also states : That by a recent decree everyone who wishes to practise dentistry and "phlebotomy" in Italy must henceforth have taken a legally recognised degree in medicine and surgery. Dentistry will, for the future, be taught in the surgical department of such medical faculties as possess the necessary equipment for the purpose.

AT the anniversary meeting of the Linnean Society, Professor Huxley was presented with the "Linnean Medal" which was instituted three years ago for those distinguished in biology. The first year two medals were given, one to Sir Richard Owen, the other to Sir Joseph Hooker. Last year it was bestowed on Professor Alphonse de Candolle. Three of these are medical men.

AT the monthly meeting of the British Medical Benevolent Fund, a satisfactory report of its working was given. During the last year the committee have sustained a serious loss by the death of their Chairman, Mr. G. C. Jonson. Sir James Paget, Bart., President of the fund said : "It was thought

that something should be done to perpetuate his memory, and asked the opinion of the meeting. Dr. Broadbent proposed, and Dr. Holman, who promised the cordial cooperation of the Epsom College Council, seconded, a resolution: "That a fund be raised in connexion with the British Medical Benevolent Fund and the Royal Medical Benevolent College, in commemoration of the late Mr. C. Jonson, Chairman of Committee of the Fund, and Chairman of the College Council." Sir Andrew Clark proposed: "That the Fund so raised should be invested for the purpose of founding a Scholarship in Epsom College, the nomination to which shall be vested in the Committee of the British Medical Benevolent Fund." This was seconded by Sir Edwin Saunders, and the Committee then proceeded with the ordinary business of the meeting. This Fund provides immediate help, without any salaried officer except the collector, all the work being done by members of the profession. Subscriptions are asked for, and may be sent to Dr. Sidney Phillips, Hon. Financial Secretary, 62, Upper Berkeley-street, W.

DEGREES FOR LONDON MEDICAL STUDENTS.—A largely attended meeting of the Senate of the University of London was held on Wednesday (June 4th), when a prolonged discussion took place on the amended report of the Special Committee charged with the duty of preparing a scheme which shall meet the recommendations of the Royal Commission on University Education in London and embody the good points in the various schemes submitted to the Senate by University and King's Colleges, and by the Royal Colleges of Physicians and Surgeons. On the whole, it may be said that the report was accepted by the Senate. It will be communicated immediately to the various bodies interested. So far as the two Royal Colleges are concerned, the Senate approved of the formation of a Conjoint Board of the University and the two Colleges for the examination of M.B. All details of course, remain to be settled.

WE read that Cardinal Lavigerie is having negroes trained as medical practitioners at Malta, and several have already completed their education and proceeded to Central Africa.

THE ANNUAL DINNER of the Athletic Club of the Dental Hospital of London was held at the Holborn Restaurant,

Venetian Saloon, on Saturday, the 21st ult. Mr. J. Smith Turner in the Chair.

At the close of the dinner, which was served in the usual excellent manner so well known to frequenters of the Holborn, and after the customary loyal toasts, Mr. Smith Turner, with a few well-chosen words proposed the toast of the evening,—“The Athletic Club,” which was replied to by Mr. E. Preedy, who enumerated the varying successes the Club had met with during the past twelve months, and thanked its numerous supporters. Mr. H. A. Forsyth also replied, and expressed a hope that more of the students would become members of the Club concluding with a singularly applicable quotation from a topical song.

Mr. C. S. Tomes proposed “The Hospital Staff,” pointing out its close connection with the Athletic Club, and coupling with the toast the name of Mr. Morton Smale, who in replying begged leave to dispute the statement that one speaker had made in attributing the fatherhood of the Club to Mr. J. F. Colyer, “at least” he said, “if Mr. Colyer was the father I was certainly the mother.”

Mr. R. H. Woodhouse then proposed the “Visitors,” and Mr. W. S. Turner, well-known in Athletic circles at Cambridge, replied and alluding to his future vacation at the Bar assured Mr. Smale he would be happy to make cut an affiliation order as to the parentage of the Athletic Club.

Mr. David Hepburn (whose humorous recitation parodying Mr. Sims’ well-known sensational poems had just evoked much laughter) proposed the health of Chairman, alluding to Mr. Turner’s great good nature in the cheerful acceptance of such tasks as the one he had so well performed that evening. The toast was drunk with éclat and musical honours.

The Musical Society of the Club contributed greatly to the evening’s enjoyment, as did also Messrs. Barrett, Wheatley, and Giles, whose songs were loudly applauded. Mr. Braine also provoked much mirth with his clever rendering of some humorous recitations, including that clever skit, “My First Cricket Match,” by our talented confrère Mr. David Hepburn.

At the seventh Sitting of the Select Committee of the House of Lords appointed to inquire into the working of metropolitan hospitals, the first time after the Whitsuntide recess. Sir Sydney Waterlow was the first witness. He said he had had large experience in hospital, poor law, and

convalescent home work in London. He was connected with the Hospital Sunday Fund, and had, consequently, become acquainted with the accounts of the London Hospitals. In 1870 he was appointed chairman of the Central London Sick Asylum. He resigned that position in 1878, and he had been treasurer of St. Bartholomew's since 1874. Very considerable alterations have been made ; in fact, he might say that the hospital was not the same thing that it was fifteen or sixteen years ago. He had had to review the working of all the metropolitan hospitals, and that had, of course, given him great knowledge of affairs. He did not think that the relief was to any large extent abused. He knew there were those who thought that the working classes of the poor should contribute more than they did, but it must be always remembered that sickness and accidents were emergencies which it was very difficult to calculate for, and it was very hard for them to lay by for these contingencies. As a rule the money that was occasionally put by was absorbed in the maintenances of the family. I think the amount of accommodation for the sick poor in London, taking the infirmaries and hospitals and convalescent homes together, has progressed fairly in proportion to the increased demands of the population. I do not hold that if the out-patients' department was done away with it would not signify to the public in London. Witness then described the regulations in force at St. Bartholomew's for the treatment of out-patients, who were, he said, first of all sorted. Those who required more careful examination were sent over to the out-patients' department. The more serious cases were admitted into the hospital. From May 19 to 22 there were 75 casualty cases and 20 accidents, 15 were sent over to the out-patient department, and 22 were admitted by direct application of the physicians and surgeons of the hospital, making 132 admitted. Recently in six days they had 2,356 medical cases of casualty—that was 390 per day. These were attended to by seven fully-qualified men. I consider that sufficient time is given to the examination of each case. On the average they would get about five minutes each. I do not think this wholesale system of gratuitous out-door relief has a pauperising effect. Out-patients might go to St. Bartholomew's from any part of London. The staff at St. Bartholomew's had largely increased. There were 667 beds divided between 28 wards. These included 80 cots. There were 345 male and 303 female. They were divided between medical, surgical, and ophthalmic. There were 194 medical

beds and 366 surgical beds, under five senior surgeons, and they had 161 nurses, in addition to 27 sisters. The nurses are practically selected by the matron, with the approval of the treasurer and the probationers. The revenue last year at St. Bartholomew's, ending December, cash available for hospital purposes, was £70,000, which was derived mainly from real property and about 13,000 acres of land in different counties, principally on the southern coast of England. I don't think there is any reason for alarm at the increase of of special hospitals; but the larger the number of hospitals the more the expense. During the time I have been treasurer we have never applied to the outer public for funds.

10th. INTERNATIONAL MEDICAL CONGRESS.

Our correspondence contains an important letter from Dr. Cunningham the Honorary Secretary in this matter for Great Britain and Ireland.

We are officially informed by the Railway Companies concerned that they will make a special reduction in the fares if not less than 30 persons apply to them, some one must take the initiative, we consider Dr. Cunningham the most suitable person, if not, the persons desirous of availing themselves of the reduced fares should submit their applications to the Railway Company by whose line they intend travelling.

In our next issue will be given not only a complete description of the best means of reaching Berlin but also the terms of several of the Hotels there.

APPOINTMENTS.

Norris, John, L.D.S., has been appointed House Surgeon to the Liverpool Dental Hospital.

Mr. Francis H. Elliwood, L.D.S.I., has been appointed Dentist to S. Joseph's Convent, Redhill, also Honorary Dentist to Hope Lodge Training House, Redhill.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the British Journal of Dental Science.

GAS OPERATIONS.

“Audi alteram partem.”

Dear Sir,—The sensible and very temperate letter of J. S. which appeared in the April number of the “Dental Record” commends itself to my unqualified approval.

The Gas question has been so frequently presented to us from a Medical standpoint that the opportunity of regarding it from the vantage ground of the Dentist is quite refreshing. J. S. truly remarks that medical men know nothing whatever about gas operations. We possess, in abundance, their own evidence of this, and it cannot be too distinctly recognised that no amount of academical learning can supply the want of practical knowledge, nor is it the privilege of any one to know everything about dentistry without learning anything. One writer advises J. S. to instruct medical men by “allowing them to see him give the gas a few times, and if necessary explain to them what he wishes them to do; they would then be quite as capable of administering it as himself,” ignoring the fact that the skilful administrator and gas operator is not the product of a few hasty lessons, but the result of years of careful practical training. There can be no objections to the presence of a medical man at gas operations, and it would be alike unfair to patient and his medical attendant to raise any, should the patient express a wish for such presence, but the dentist who voluntarily calls in the aid of a medical man and mulcts his patient in double fees registers his own dishonesty or incapacity by that simple act.

I do not agree with those writers who arbitrarily lay down the law that no gas operation ought ever to take place in the absence of a medical man, nor do I think it can be expected that any capable dentist, doubly qualified by practical training being, both an experienced administrator and skilful operator will consent to stultify himself by conducting his practice on principles to harmonize with the limited attainments of others.

The dentist who fully realizes his responsibilities, respects himself and the lives of his patients does not, willingly, delegate to others the duties of either administrator or operator. Some writers contend that these ought always to be separated. I do not hold this view. There are cases where advantages and better results may be obtained by a contrary method; this teaching has recently been combatted in the “British Journal of Dental Science,” by Dr. Dudley Buxton, who says he “has never before met with anybody who has taken up this position,” i.e., the position taken by myself; this remarkable assertion has been made in face of the fact, that some specialists who have had

the largest experience have adopted precisely the same position, and now stand pre-eminently in the forefront of successful gas operators. Dr. Guilford, who can show a record of two thousand successful cases, in his useful little manual on "Nitrous Oxide," published three years ago, says, page 53, "Some writers insist upon having the assistant administer the gas, so as to leave the operator free. *We see no necessity for this, indeed we prefer to be both administrator and operator.*" The italics are my own.

With the mere anæsthetists who are not skilful operators, or vice versa, there is no alternative; the duties must be divided or the gas left alone, and it becomes incumbent upon them to defend to the utmost their only position.

Yours faithfully,

J. OTTLEY ATKINSON.

Kendal, June 7th, 1890.

To the Editor of the British Journal of Dental Science.

TENTH INTERNATIONAL MEDICAL CONGRESS.—SECTION XIV.

DISEASES OF THE TEETH.

Dear Mr. Editor :—The Committee of Organisation at Berlin has nominated Mr. Mummery, of London, Mr. Macleod, of Edinburgh, and Mr. Baker, of Dublin, as Honorary Presidents, and myself as Honorary Secretary for Great Britain and Ireland at the above Congress, and as they earnestly desire that our country should be fitly and honorably represented they appeal to members of the profession to assist them in achieving this object by their attendance, by communications, by demonstrations and by exhibits. Notification of any intention to contribute in any, or all, of these ways should be sent to the Hon. Secretary with the least possible delay.

As no doubt many of your readers have been wondering as to what has been done with regard to the Congress, the following information may not be without interest. The work of the Congress will begin on Monday 4th, and terminate on Saturday, 10th August, being conducted as usual in both General and Sectional Meetings. A considerable part of the Sectional Work will be conducted in English, as nearly one half of the Papers promised are from America and our own country. A list of the entertainments and social gatherings has not yet been issued, but these, no doubt, will be both numerous and attractive. Previous experience of Berlin hospitality on a similar occasion warrants me in recommending this as an especially favourable opportunity for a visit to this fine city and its environs, as not only will places and objects of interest usually inaccessible to the ordinary visitors be open freely to Members of the Congress but many of them will be seen under particularly attractive, if not unique conditions.

The Demonstrations at the Dental Institute, besides being interesting in themselves, will afford a favourable opportunity for examining a well-equipped school of modern dentistry whose progress and success partakes even somewhat of the phenomenal.

Some little misunderstanding seems to have arisen from the fact that some members of the profession have received special invitations from Berlin whilst others have not. Such invitations were sent to all members of the Odontological Society by the Committee of Organization, but there was not the slightest intention to confine membership of the Congress to those personally invited. Any duly qualified British practitioner is eligible for membership on paying his subscription of £1, which will also entitle him to receive a copy of the whole of the Transactions of the Congress.

In connection with the Congress will be held an International Medical Scientific Exhibition in the Landes-Ausstellungs-Parkes, which will open on the 2nd and close 11th August. This exhibition is expected to be both very large and interesting. Anybody and everybody, scientific and non-scientific, learned or ignorant, are invited to take part in the exhibition. It may therefore, be as well to state that the conditions with regard to rent, (on the application forms which have been sent out) are only meant to apply to any Firm or Manufacturer who is exposing his wares for the purpose of advertisement. Space will not be charged for where the exhibits of purely a scientific nature are made by members of the profession. The unpacking and packing of the exhibits from abroad will be undertaken by an experienced firm of expedition Agents specially engaged for the purpose.

The Department of Odontology will be under the control of Professors Busch, Miller and Sauer. The date for closing the application list is fixed for June 15th, but I am informed that any exhibit announced by any member of the profession in this country a few days after the specified date will be gladly received. Application Forms may be had on application to the Hon. Secretary for this country.

The following practical tips may prove useful to intending visitors. You will avoid a good deal of trouble and worry by securing your Card of Membership before leaving by remitting direct to the General Treasurer, Herrn Samtättsrath Dr. Bartels, Berlin, S.W., hei prigerstrasse No. 75, and enclosing your visiting card with the Postal Money Order. Ladies can also obtain cards of membership, which will entitle them to assist at the Meetings, to visit the Exhibition, and, what is most important, to procure cards for the various social functions.

With regard to travelling, it will be well to remember that Monday, 4th August, is Bank Holiday, and that consequently on the Friday and Saturday previous the travelling accommodation will be more than usually taxed. The best route from London is by Flushing (24 hours)—for those who prefer a longer sea voyage, the journey by rail from Hamburg or Bremen is relatively short. The Great Eastern Railway Company have offered special facilities, if a sufficient number apply, by way of Rotterdam, with a facultative return via Antwerp. This route would enable members to spend a pleasant holiday in Holland or Belgium as they return.

Any further information received will be duly communicated, with your kind permission, in the next number of your Journal.

Yours very faithfully,

GEO. CUNNINGHAM.

2, King's Parade, Cambridge.

British Journal of Dental Science.

No. 539. LONDON, JULY 1, 1890. Vol. XXXIII.

A CASE OF TIC DOLOUREUX.

BY FREDERIC C. WOOD, L.S.A., Lond., Res. Med. Off.
Nottingham Friendly Soc., Late Ambul. Surg., and
Act. House Surg., Royal Southend Hospital,
Liverpool.

THE patient was a boot and shoemaker, aged 53 ; he first came under my care last autumn, complaining of severe pains in the right side of the head, he told me he had for the last four years been under my predecessors for the same complaint, generally coming on during spring and autumn. When first I saw him, the pains in his head, were of the most agonizing description, coming on at intervals of about ten minutes ; during the paroxysms he would pace up and down the room, raving like a madman ; on examining him I found he complained of pain on moderate pressure over the parital eminence of the right parietal bone. The pain was of a shooting, darting character, downwards to the roof of the mouth. At the end of one of these paroxysms he would complain of "a nasty tasting discharge in his mouth," on examining the mouth I found all his teeth in a shocking condition, all being more or less carious, and the odour of his breath was something disgusting. His wife informed me that he was a man who had had more than his share of the world's grief and sorrows. I ordered him to have one or two of his teeth, which seemed to me to be a possible cause of his complaint, out. I also prescribed a liniment of Aconite, Belladonna, Ammonia, and Rape Oil, to be well rubbed over the seat of pain, and ordered him to take a mixture containing Quinine, Pot. Iodide and Gelsemium. He showed no signs of improvement under this treatment, nor did he under any of the following drugs which I subsequently employed, viz.—Chloride of Ammonium, Arsenic, Croton-Chloral, and Morphia. So, as a last resource, I gave him Pot. Brom. and

Chloral Hydrat., fifteen grains of each every four hours; under this last treatment he rapidly improved, and was practically well in six weeks, and for the following two months I gave him gradually increasing doses of Arsenic with Iron.

I heard nothing more of him until the middle of March of this present year, when I was again sent for, only to find him in precisely the same condition as he was last autumn; he was then very thin, and presented a careworn appearance, and I again fell back on Pot. Brom. and Chloral Hydrat., with a strong recommendation to have all his teeth taken out, seventeen in number, without delay, to which he very soon consented. Accordingly on Sunday morning, early in April, I proceeded to put him under chloroform. A Mason's gag was very readily placed in his mouth, and Messrs. Wing, surgeon-dentists, then removed the whole of his teeth, seventeen in number, Dr. Watkins also assisting, hæmorrhage being restrained as they went along, by means of perchloride of iron, alum and hamamelis were first tried, but found quite inefficient. He very quickly recovered from the effects of the operation, and at the present time he is looking remarkably well, in fact he looks hardly the same miserable wretch as he was when I saw him in the middle of March, and he has had no return of the pains whatever. All the teeth extracted were more or less carious, and he is now waiting for the time when he will be able to purchase a complete set of artificial teeth. This was clearly one of those aggravated forms of *tic douloureux*, the causes of which are at times so obscure, although I think there can be very little doubt as to the cause in this case, and I have every reason to believe the effects of our operation will be permanent.

NOTES ON THE PREPARATION OF MICROSCOPICAL SECTIONS OF TEETH AND BONE.*

By J. HOWARD MUMMERY, M.R.C.S., L.D.S.

Mr. President and Gentlemen,—My communication to the Society to-night will be chiefly of a technical nature, but I think it may be interesting to many members to introduce to them a method of preparing sections of teeth and bone which

* A Paper read before the Odontological Society of Great Britain.

has not been generally in use in this country, and which may prove of considerable service in studying the histology and pathology of the teeth.

I also propose to exhibit on the screen some photographs of specimens prepared in this way, demonstrating certain points in dental structure, which it especially well brings out. We have all of us gone through the tedious process of cutting dry sections of teeth, and found it, in a measure, unsatisfactory, for we have the tissue in a dried-up condition, having procured, in fact, but the preparation of a skeleton—the soft parts having entirely disappeared, and the relations of the dentine and cementum to the pulp and peridental membrane being entirely lost.

Although such dry sections are instructive, there is a sharp limit to their usefulness, and some other method must be resorted to if we wish to study the relations of the pulp, and its odontoblast layer, to the formed dentine, and of the cells and tissue of the peridental membrane to the cementum.

Prior to the commencement of calcification, of course the ordinary methods employed in the histological study of the soft tissues of the body, are fully available, but when calcification has commenced, the unequal degree of hardness of the tissues renders the ordinary method useless.

To study a developing tooth in which calcification has commenced, it is necessary to decalcify the portion already impregnated with lime salts; to remove these latter by the action of an acid.

Although much has been, and can be done with these decalcified specimens, they also have serious drawbacks.

It is very difficult to cut sections of these preparations with the microtome, without displacing the decalcified tissue from the pulp and peridental membrane; a few happy specimens only, among a large number of sections, exhibiting the soft parts in contact with the dentine and cementum, and we rarely procure a very thin section available for the higher powers of the microscope by this method. But there are other drawbacks to the process—we do not know exactly what alterations may be produced by the acid employed, both in the decalcified portion and in the cell elements.

As pointed out by Dr. Black in his work on *The Periosteum and Peridental Membrane*, the action of the acids "is injurious in a large degree, and robs the tissues of that freshness so necessary to the gaining of good views of their constituents." He also points out that the finer chemical

relations of the tissues, rendering them susceptible to delicate stains, are often disturbed by the acids used, and selective staining rendered impossible.

Being struck with the imperfections of the usual methods of preparing tooth sections, and disappointed with my own results, I was interested by a suggestion made to me by Mr. Tomes some two years ago.

Professor Moseley, of Oxford, had mentioned to him a plan of hardening sections of teeth and bone by gradually increasing strengths of alcohol, and then impregnating them gradually with a solution of dried Canada balsam in chloroform, but giving no detailed account of the process.

In the *Journal of the Royal Microscopical Society* for December, 1888 (p. 1042), an extract was published from the *Zeitschrift für Wissenschaftliche Mikroskopie*, giving a detailed method of carrying out this balsam process by Dr. L. A. Weil.

I prepared some sections according to these directions, and was so pleased with the results that I have since cut nearly two hundred specimens in this way. By employing this process no decalcification is required, and the cells and connective tissue of the pulp and also of the peridental membrane are retained in their natural relations to the hard tissues.

To quote from the extract in the *Microscopical Society's Journal* :—

“ Dr. L. A. Weil takes only fresh, or nearly fresh teeth, and in order to allow reagents and stains to penetrate into the pulp cavity, divides the tooth immediately after extraction with a sharp fret saw, below the neck, into two or three pieces, allowing water to trickle over it the while.”

To procure longitudinal sections it is advisable to cut them a little to one side of the pulp cavity, just opening this enough to enable stains to penetrate.

“ The pieces are then laid in concentrated sublimate solution to fix the soft parts.” The advantage of the sublimate appears to be due to its coagulating the albumen of the tissues—it certainly seems to be very efficacious in preventing shrinkage.

“ The sections are then washed in running water for about an hour, and placed in 30 per cent. spirit for twelve hours, and for a corresponding period in 50 per cent. and in 70 per cent. spirit ? ”

“ To remove the black sublimate precipitate the teeth

are then laid for twelve hours in 90 per cent. spirit, to which 1.5 to 2.0 per cent. of tincture of iodine has been added. The iodine is removed by immersion in absolute alcohol until the teeth become white?"

"They are now ready for staining, and the stain which Dr. Weil recommends is borax carmine (alcoholic or aqueous solutions). After being washed for fifteen to thirty minutes in running water, they are left in the stain for two or three days; they are then transferred to acidulated 70 per cent. spirit, 100 ccm., muriatic acid, 1 cm.), in which they remain—the watery stained ones at least twelve, the alcoholic stained ones twenty-four to thirty-six hours. They are then immersed for fifteen minutes in 90 per cent. spirit and then for half-an-hour in absolute alcohol, after which they are transferred to some etherial oil for twelve or more hours.

"The etherial oil is quickly washed off with pure Xylol, and they are placed for twenty-four hours in pure chloroform; after this they are passed into a solution of balsam in chloroform.

"This balsam is prepared by drying in a water bath heated gradually up to 90° C. for eight hours or more, until when cold the balsam will crack like glass on being punctured."

Much trouble may be saved by procuring this desiccated balsam ready prepared.

"The sections are allowed to lie for twenty-four hours in a thin solution of this dried balsam in chloroform, and then as much balsam is added as the chloroform will take up. The sections covered with the balsam solution are then placed in a suitable receptacle over a water bath, kept at 90° C., and this cooking kept up until the mass of balsam, with the teeth in, cracks like glass when cold. This requires two or three days.

"Thin pieces are then cut from them with a sharp fret saw, under water, and they are then ground down" (first on a corundum wheel, afterwards on a stone) "and in the usual manner."

My most successful sections have been ground down on a washita stone, using a piece of cork, or the finger, and plenty of water.

The *débris* can be very conveniently washed off the completed section with a fine spray of water blown through an ether spray apparatus. The section is then mounted in chloroform balsam.

The process, as detailed, no doubt appears very tedious and

complicated, and it is almost enough to deter anyone who has but little leisure from undertaking it, but when a number of sections are being prepared in different stages, the passing on from one solution to another does not occupy much time.

Wolrab's gold bottles in a rack form excellent receptacles for the sections, a note being made on a label on the bottle, of the stage they have reached.

With this, as with most other processes, there are of course a good many failures, some being caused through insufficient cooking, the pulp not being sufficiently hardened; too prolonged cooking, on the other hand, is apt to cause brittleness.

The cutting down is certainly very tedious and must be done on a slow cutting stone; rapid cutting, as with a turkey stone, I found resulted in the pulp being crowded with small particles of the stone, which adhere firmly to the balsam, and I know of no means of getting rid of them.

Of course, too, without great care, in grinding very thin sections the pulp may break away at the last moment, and it is only by practice one can learn to avoid this annoying accident.

The stain recommended by Dr. Weil—borax carmine—penetrates well, and stains the nuclei very strongly, but does not give so much detail in the pulp as some other stains. Very good results may be obtained with aniline blue black, which stains the nerve fibres as well as the nuclei and connective tissue. I have not been very successful with hæmatoxylin, but am told that Erlich's hæmatoxylin, which does not precipitate, would probably be the best stain to use in this process.

I must here express my indebtedness to Mr. Theodore Harris for the great help he has given me in preparing these sections; his assistance has been invaluable in carrying through most carefully the tedious preliminary processes.

The teeth I have made use of have been chiefly young bicuspid, some with the apex of the root still incomplete—extracted for regulating purposes, and I take this opportunity of thanking several friends who have sent me specimens.

I have also made sections of older teeth for comparison, and of some carious teeth and abscesses. In these latter I think the process might prove very useful—enabling one to study the early stages of abscess formation.

Mr. Swift has been kind enough to attend with his projection microscope, by means of which he will be able to

project upon the screen the actual preparation on the stage of the microscope. With this instrument we are limited to low-power objectives, as with higher powers there would be too great a diminution of light.

The transparencies presently to be shown are necessary to exhibit the *details* of the specimens, but the slides now shown with a one-and-a-half inch objective, will serve to indicate some of the advantages of the process—as the retention of the pulp in its natural relations to the dentine, and the absorbent cells in temporary teeth occupying the excavations in the tissue, and in the slide showing the rat's molars, it will demonstrate that without decalcification we can exhibit the teeth in their natural relations to the surrounding bone.

The slide showing a longitudinal section of a molar tooth, which has been the subject of severe attrition, shows a secondary deposit in the pulp, surrounded by a transparent zone in the dentine, opposite the surface which has been exposed to the greatest wear.

The transparency No. 1, shows a transverse section of the pulp of a bicuspid tooth. It exhibits the pulp with its relations to the walls of the pulp cavity apparently undisturbed. The odontoblast layer is seen (very distinctly differentiated from the rest of the pulp) lying in immediate contact with the semi-calcified portion of the dentine—the tissue “on the border-land of calcification,” that part of the matrix which has evidently undergone some change, in advance of the line of complete calcification. The blood-vessels are seen in transverse section, and also the slightly denser condition of the central part of the pulp, noticeable in many of these specimens.

The next slide from a similar pulp, is interesting as showing, in the large blood-vessels in the centre, what very delicate tissue can be retained in position by the hardened balsam during the process of grinding.

The next slide shows a portion of the pulp and the forming dentine, taken with a half-inch objective and magnified eighty diameters. A blood-vessel is involved in the line of odontoblasts; the semi-calcified portion of the dentine is well seen, and the rounded masses of the lime salts marking the line of complete calcification. These rounded masses are still better seen in the next slide, from a longitudinal section at the margin of the pulp cavity—the coalescence of the globules to form the fully calcified tissue being very clearly shown.

The next photograph shows a transverse section from one

of the cornua of the pulp of a bicuspid tooth, showing chiefly connective tissue, and small cell nuclei, and apparently no true odontoblast layer.

The next slide is taken from a tooth which was extracted before the apex of the root was completed. The portion photographed is close to the open end.

The odontoblast cells, which, together with their nuclei, have taken the stain deeply, are seen not to be lying in close contact, but to have distinct spaces between them. I do not think this is due to shrinking in preparation, as I have found it in all the open-ended bicuspid teeth I have examined, and other specimens prepared by this process seem to indicate that there is no appreciable shrinkage of the odontoblast cell. Mr. Hopewell Smith, in a paper published in the *Dental Record* for August, 1889, speaking of the dentine after the commencement of calcification, says :—"Between some of the cells of the membrana eboris there are wide visible spaces, filled with homogeneous substance and small round and angular cells." Mr. Tomes also appears to have somewhat modified his views on this point, for whereas in the earlier editions of his "Dental Anatomy" he says (p. 154, second edition)—"The odontoblasts are fitted closely together, and there is no room for any other tissue between them so long as the formation of dentine is actively going on;" in the third edition the words are—"There is not much room for any other tissue between them" (third edition, p. 169). The squareness of the cell towards the forming dentine is very evident in this specimen.

The next slides show the applicability of this process to the study of the peridental membrane. This photograph, taken with a one-sixteenth Powell and Leland, $\times 500$, is from the margin of the cementum in a transverse section of a bicuspid tooth, stained with aniline blue black. The outer and more recently formed portion of the cementum has taken the stain strongly, and exhibits with great clearness the penetrating fibres of Sharpey,—connective tissue fibres from the peridental membrane passing deeply into the hard tissue, which in this portion seems to be chiefly made up of them. Between these bundles of fibres, where they enter the cementum, are seen the large cementoblast cells concerned in the formation of the tissue.

Dr. Black ("Periosteum and Peridental Membrane," p. 102) describes these cells as being always flattened, with one of their flat sides resting upon the cementum, and of very

irregular outline, and considers that in ordinary sections we only see a profile view of them. Their true shape is, he considers, seen in sections of the peridental membrane taken parallel to the surface of the cementum.

The appearances presented by some specimens I have prepared by this process indicate something in the development of dentine not quite in keeping with the ordinary views.

There appear to be processes of the connective tissue of the pulp, adherent to the dentine, very like the penetrating fibres of Sharpey in bone. I have not yet completed my observations on this point, being at present engaged in investigating other varieties of dentine for this purpose.

In the next photograph also from a transverse section of a bicuspid, a line of little nests of round cells is seen lying among the fibres of the peridental membrane. These agglomerations of cells lie at a little distance from the surface of the cementum, and are usually seen in young teeth, when the sections are sufficiently thin. They vary considerably in size and in the number of cells composing them. Dr. Black considers them to be lymphatics; he describes them as being more numerous near the margin of the gum, and in sections of the peridental membrane, which he has cut parallel to the surface of the cementum, at such a distance as to include them, he finds that these apparently isolated bodies are connected by a network. The groups of cells seem to be enveloped in a very delicate limiting membrane, which is, I think, visible in the next slide (taken with a one-sixteenth objective, $\times 500$). He looks upon this structure as "lymph canals packed with lymphoid cells," rather than as true lymphatic glands.

In a case of suppurative pericementitis he found the supuration running along the lines of these lymphatic chains to a great distance, suggesting that this tissue may be the seat of the disease.

Malassez does not consider them to be lymphatics, but the remnants of the enamel organ which extended beyond the region of forming enamel in the early stages of development.

We will now pass to some examples of absorption. The next slide shows a temporary molar in longitudinal section, with the absorbent organ *in situ*—the cells filling up the excavations in the dentine. Magnified 170 diameters. This preparation shows, perhaps almost better than any other, the advantages of the process I have described.

It is very difficult by ordinary methods to obtain a thin section of dentine with these absorbing cells in position, such preparations being usually quite fragmentary and the result of happy accidents. It appears to show plainly that the gradual increase in the strength of the alcohol and the preliminary coagulation with the sublimate solution prevents shrinking, as these cells completely fill the lacunæ or excavations in the dentine. This was one of the first preparations I made in this manner, and I have looked upon it as one of the test slides of the process.

In the parts of this preparation where the groups of cells are prolonged deeply into the dentine, the individual cells are large and rounded in outline. In other parts where the excavations are not so deep, ordinary multinucleated giant-cells are seen lying in contact with the dentine.

There seems to be still a good deal to be studied in absorption of the temporary teeth—the method of action of these cells being little understood. Whatever substance these cells secrete does not seem to produce any softening action of the tissue much beyond the point of contact—the excavations being clean cut and distinct.

Passing to absorption in adult teeth : as in bone, so in the cementum of healthy teeth, tooth absorption and deposition go hand in hand—many young, and to all appearance healthy, teeth, showing absorption spaces filled with giant cells, and old excavations filled up with newly-deposited material.

The photograph now on the screen is from a bicuspid extracted at fifteen years of age, and a distinct absorption is seen in the cementum, the excavation being filled up with large cells similar to those seen in the absorbing temporary tooth.

The next slide, taken from a longitudinal section of a molar in which a small piece of the bone of the alveolus remained attached to the tooth, shows the bone on one side and the cementum on the other, the periodontal membrane and periosteum filling the interval between them. There appears to have been here considerable excavation of the alveolar bone, and also a large absorption of the cementum, which has been filled up with freshly deposited tissue—the repair being actually in progress in this case—the cementoblasts being crowded together on the newly-formed cementum, as the osteoblasts are on the surface of depositing bone.

Deposits of secondary dentine in the pulp are well exhibited by this method of preparation. The specimen shown was taken from a molar tooth, to all appearance sound, which

caused intense neuralgia, rendering it necessary to extract it. The pulp was densely packed with secondary deposits, encroaching in every direction upon the nerves and blood-vessels. This deposit exhibits some curious concentric and radiating masses. The next slide is from a similar pulp, showing some very large deposits.

Another shows a tooth extracted from an old person, in which the whole of the pulp appears to be converted into a semi-calcified material, apparently of cartilaginous consistency with islands of calcified tubular dentine. I have been struck with the fact pointed out by Mr. Salter in his "Dental Pathology"—that many young and apparently healthy pulps show numerous deposits of secondary dentine. Mr. Salter in the work referred to (p. 139) says: "This change is to a great extent reparative and the result of trivial causes, though I believe it never occurs unless the tooth has been in some way the subject of injury or irritation.

The specimens in which I have seen it were certainly untouched by caries; but they may have been subjected to some form of irritation conveyed to the pulp from the great pressure caused by overcrowding.

Interglobular spaces in dentine are very well stained in the balsam process.

Caries in a fissure in the enamel.—This slide was prepared to show that the process, while keeping the relations of the carious portion to the calcified tissue, retains also in position tissue that has undergone a very considerable amount of disintegration.

The last slide is taken from a rat's incisor, and shows the remarkably strong connective tissue fibres of the pulp.

In conclusion, gentlemen, I have to thank Mr. Swift for so kindly giving his valuable personal attention to the microscope and lantern, and to thank you for your kind attention; expressing the hope that some of the points I have simply touched on to-night may suggest lines of investigation to those engaged in microscopical work.

WEIL'S PROCESS.

Fresh teeth cut under water with watch-spring saw.
Concentrated corrosive sublimate solution for some hours.
Running water one hour or more.
30 per cent. spirit, twelve hours.
50 per cent. spirit, twelve hours.
70 per cent. spirit, twelve hours.

90 per cent. spirit, + 2 per cent. iodine, twelve hours.

Absolute alcohol till teeth are white.

Running water half an hour.

Stain borax carmine, &c., three to seven days according to stain used.

70 per cent. spirit (+ 1 per cent. H.Cl. if borax carmine) twelve to thirty-six hours.

90 per cent. spirit, fifteen minutes.

Absolute alcohol half-an-hour.

Etherial oil, twelve hours.

Wash this off with xylol.

Chloroform, twenty-four hours.

Thin solution of dried Canada balsam in chloroform.

Thick solution of dried Canada balsam in chloroform.

Water bath at 90° C. till hard.

IS REMOVAL OF THE TONSILS DANGEROUS.—The French correspondent of the *British Medical* writes removal of the tonsils by the bistoury or guillotine is a popular operation in this country. The French are less partial to it, and M.M. Quénu and Lucas-Championnière have recently dwelt on its dangers at the Paris Société de Chirurgie. The latter surgeon referred to two cases in Croca's practice where profuse hæmorrhage followed removal of the tonsils. In one of these instances the patient, a medical student, died almost immediately after one tonsil was cut, so violent and uncontrollable was the bleeding. In a case in Mr. Lucas-Championnière's own experience the patient, a middle-aged man, had enlarged tonsils, quite free from inflammation, and he was not subject to any morbid condition liable to prevent the natural arrest of hæmorrhage. On removal of one tonsil hæmorrhage took place and could not be checked until after two hours of digital pressure with a tampon soaked in ergotine. M. Quénu always uses the galvano-cautery three or four times, at intervals of a fortnight, and atrophy of the tonsil always follows. MM. Marc See and Chauvel do not dread the knife. There can be no doubt that hypertrophy of the tonsils requires active treatment, especially in youth; the evil consequences of neglect are well known. In the majority of cases the risk of dangerous hæmorrhage is very slight: but the possibility of its occurrence should always be borne in mind, and the use of ice or of a styptic gargle should be enforced as a measure of precaution immediately after the operation.

British Journal of Dental Science.

LONDON, JULY 1st, 1890.

"ON TO BERLIN!"

IN a few more weeks the gathering for the Berlin Medical Congress will have come and gone. Time presses. Now or never must they, who intend to be present, make their arrangements and settle their plans. There are many reasons why Englishmen should muster in good force at Berlin. The English are, it is true, a mass of incongruities, a little bit of everything and not much of anything, still, perhaps, we have more affinity to the Germans than to any of the other races across the silver streak. We do not, of course, mean that such very ancient history as our common Teutonic origin should have some sentimental attraction to us, but that, probably, John Bull once outside his "tight little island" is nowhere so much "at home" as in the "Vaterland," be the cause what it may. But this is merely by the way, there are other and more urgent reasons which tend to make a visit to Berlin pleasant and profitable. Gradually during the last half of the century, political influence and activity have reversed the law, "Everything moves westward," and have wandered eastward, from Paris to Berlin, there must, therefore, be a great satisfaction in seeing for ourselves the city which is so often in our minds. And this city is itself worth seeing, growing and developing, as it is, in a way hardly less astonishing than our own London. And the city will be in gala dress. It is one of the great advantages of going at such a time as this, that we are enabled to see what at other times would be shut up and hidden, whilst the festivities which have been arranged

cannot but add to the enjoyment of the trip. Nor need the object of this be simply to see Berlin. A glance at the map is sufficient to show what picturesque districts are either on the direct route, or at least readily get-at-able, districts all the more interesting because off the beaten track, and where we should meet other people, than one's sisters, one's cousins, and one's aunts following each other in parrot-like array. Thus we hope to have at any rate suggested that the year's holiday will not have been spoilt by going to the Congress. But moreover, it is incumbent upon us all to make as good a "front" as is possible for the credit of our profession. We have much that we could show and tell, and there will be much that we can see and learn. We shall be able to leave behind facts, hints, suggestions, which will be carried forward to our credit account, and we shall bring back with us methods, plans, ideas, which we shall certainly be able to carry forward to our capital account. To those who fear the language, it may be comforting to know, that though the Englishisation of the world, (as fondly dreamt of by some), has not yet so far progressed that English is adopted as the official language, yet a knowledge of it is widely spread in Germany, and at any rate they have the comfort of knowing that three of the five papers, which it is proposed to read before the Dental Section, will be in English. We have from time to time given our readers the various particulars of arrangements that had been made, or which were expected to be made. One or two we may recapitulate. The Congress sits from August 4th to August 9th. The Dental Section will meet for clinics every morning from 9 till 1 p.m. o'clock, and every afternoon from 2 to 5 o'clock for papers and discussions. The languages being English, German and French. The subscription is one pound, each member being entitled to a copy of the Transactions, and various "Festschriften" will be presented. There will be Sectional dinners, and a grand farewell banquet given by the Committee. There is to be a special Journal reading-room, in which will be found copies of all the Journals for the current year, and a museum. While last, but perhaps not least, the member's wives will be comforted and amused by a special ladies' committee.

WE do not know whether Dr. W. H. Trueman like *Balaam* of old, set out with the intention of uttering a curse. But somehow or other, rightly or wrongly, his paper on copper amalgam, abstracted in our last issue from the *Cosmos*, gives us this impression.—Certainly he resembles the prophet in staying to bless. “Four advantages over other amalgams have been claimed,” he says—

1st, it retains its form.

2nd, it does not stain the teeth, though changing colour itself.

3rd, it is antiseptic.

4th, it is permanent.

The first he fully concedes :—Of the 3rd he is “not convinced that copper amalgam has any greater tendency to retard or prevent the recurrence of decay than any other material, that makes an equally tight filling.” But since by conceding the first claim, he admits there is no amalgam which makes an equally tight filling, he really has to grant the third in spite of himself. The 4th he says “it is fairly entitled to.” So we have three counts out of four in its favour, for it is only the 2nd that he “decidedly disputes.” For ourselves, having been taught from our youth upwards, in common with, we believe, the majority of English “dentals” that copper amalgam does stain the teeth, we need not follow Dr. Trueman in re-discovering these well-worn facts for ourselves. The degree of staining certainly varies, in some it may discolour only a thin layer of tooth substance, whereas in others, the whole tooth has become stained. It has been said that the former is the case, with living teeth, the latter with dead. We would commend this point to the observation of our readers. It must be said of “Copper amalgam” as of every other good thing, “It should be used, not abused.”

WE are all glad when dentals distinguish themselves, in other than, as well as in, professional matters. The following from the “*Western Dental Journal*” is worthy of note.

“ Dr. Parr figured in a good many daring exploits during our “ unpleasantness.” It was he who with ten men captured the Roanoke of the United States Navy while she was lying at Cuba early in the war. He had but ten men and there were ninety-six on the Roanoke before her capture. He held her for two or three days, cruising about the Bermudas the while, as the Federal Government refused to bond her, and as the British authorities also made things unpleasant for her captors, they burned her. Dr. Parr was also with Morgan’s men before he commenced his career in the Confederate Navy.”

Dr. Parr is well known by his inventions, among others, his much valued “ Separator.”

TALKING about distinguished dentals, reminds us that quite a number like to live in distinguished houses. Dr. Bonwill, of “ electric mallet ” fame, lives in what was General Grant’s house in Philadelphia, the acquisition of which is thought by some of his fellow “ Yanks ” to be a proof of quite superfine “ cuteness.” In years gone by, Mr. Cronin occupied the house in Holles Street in which Bryon once lived. Ill health has unfortunately compelled Mr. Cronin to give up practice, and the house has gone the way of all flesh, to make room for a draper’s “ extension of premises.” Whilst old Mr. Merryweather did, and his successor, Mr. Dewes, now does occupy the house in Brook Street, where once upon a time Handel lived. At Liverpool, Messrs. Rowston and Matthews, practised in the house in which Mr. Gladstone was born. The bedroom being now an operating room, indeed, one lady is said to have pointed out the actual position of the bed. Ladies are always fond of details, how they get hold of them goodness only knows.

MUCH as we admire Dr. Bonwill’s electric mallet, we are afraid it must yield the palm for novelty to, what the *Medical and Surgical Bulletin* describes as—The latest and

most unique electrical invention, viz. a machine for buttering bread. It is used in connection with a patent bread-cutter, and is intended for use in prisons and reformatory institutions. There is a cylindrical shaped brush, which is fed with butter, and lays a thin layer on the bread as it comes from the cutter. The machine has a capacity cutting and buttering 750 loaves of bread in an hour. The saving of butter and bread and the decrease in the quantity of crumbs is said to be very large.

In referring to the need for Dental Surgery among soldiers we quoted, in a recent issue, the hypothetical question "What would have happened if Wellington had had the toothache at Waterloo"? During the recent series of performances at Oberammergau, we read, this accident befell Josef Mayer, the player of Christus. Herr Mayer has devoted his life and has been specially trained for this one part, which he has brought well nigh to perfection. The mere study of his face is said to be of absorbing interest, and no doubt he is in a great measure the attraction which draws the many from far off lands to this little Bavarian village to witness this play. Judge then the disappointment when they learnt Mayer was in bed with intolerable toothache and a face hideously swollen. Seeing that this kind of thing is among the preventable ills of life, public men especially such as actors, singers, etc., certainly are unwise not to take the needed precautions. In these days of grand-motherly legislation one would almost wish these precautions should be rendered obligatory to all such, for their own sake's and the public's.

"EXTREMES MEET" IN RUSSIA, OR, AT ANY RATE, THEY ARE TO BE FOUND.—Professor Sklifossowski, of Moscow, who recently operated on a wealthy inhabitant of Odessa for abscess of the hip, is said to have received a fee of 11,000 roubles (£1,222), which, with rare generosity, he has since

handed over to the University of Odessa for the foundation of a bursary in its new medical faculty. The fortunate surgeon further improved the shining hour of his visit to Odessa by earning the trifling additional honorarium of 2,000 roubles (£222) for operating on a lady for cancer. These fees, however, are for the elect. In Russia, as elsewhere, the rank and file of the profession earns little beyond a bare livelihood, many practitioners having to be content with an average yearly income of 600 or 700 roubles.

THAT AUTHORITIES DISAGREE IS PROVERBIAL.—It is, however, decidedly embarrassing when they differ in their explanations of rules and regulations. Dentals in Germany have just had a sample of this.—A new order has recently been issued, enacting that in future all Dental candidates will have to spend one year in actual practical work and two in University studies. The question is, does this mean a three years course or two? May the two courses be worked coincidentally or must the one succeed the other? The "*Centralverins Deutscher Zahnärzte*" brought the point before the "Bundesrathe through the Reichskanzleramt, and were informed that a three years course of study was meant. But when a student wrote to the Kultusministerium for information, he was told the two courses could be completed at the same time, hence a two years course was meant. The Bundesrath has affirmed its previous declaration, so that in future three years will have to be spent by the student.

TEETH EXTRACTING BY LIMITED LIABILITY.—Under this heading the "*Mining World*" makes the following very pertinent remarks:—"The public are invited to subscribe for 5,000 shares, out of a total of 7,500 issued by the London Drug and Dental Company, Limited, which in some unexplained way is mixed up with a concern called "The Sapo Detergent Dentaline Company," as to which we should like to have further particulars than those vouchsafed in this pro-

spectus. The board of this tooth extracting company does not strike the eye as being particularly strong, but we are really curious to know if the Charles Samuel Bensted figuring here as a director, "who will join the board after allotment," and who is described as a "surgeon dentist," is the same gentleman who varies the operation of tooth drawing with that of a mining broker on the pavement in Old Broad Street. The company, it is stated, is to take over three going concerns, two of which appear to have been carried on by the said C. S. Bensted at his offices at 10, New Broad Street, and also at Forest Hill, which we assume is the domestic oasis to which he retires as the shades of night approach. There is certainly one true remark in the prospectus, namely, that Old Broad Street is in the heart of the City of London; but it does not follow from this that there is a general demand on the part of the public that their teeth should be extracted, any more than can an inference be drawn from the fact that the 80,000 season-ticket holders who find themselves each morning face to face with Mr. Bensted's office are anxious to undergo that operation which is decidedly an unpleasant preliminary to lunch. It is more than probable that the 80,000 season-ticket holders are bent metaphorically, if not literally, upon extracting the teeth of other people rather than of having that kind office performed upon themselves. Still less do we see the force of the observation in the prospectus that 3,000 omnibuses pass through Old Broad Street daily. Surely *they* do not require their teeth extracted. We are told that the "Sapo Detergent Dentaline," which the company will acquire, has achieved great success; but of this specific, whatever it may be, we frankly own we hear for the first time. A large number of contracts are specified; but beyond the statement, that the vendors have agreed to take half the purchase money in shares, the precise terms are not given in the prospectus. The advantages the shareholders will acquire are pointed out, and we suppose that they will have priority when they require their teeth to be extracted. The company is likely to do that for them financially should they have the temerity to join it. For vagueness, the following certificate

beats in a canter any document of a similar kind we have ever seen. It is by a chartered accountant, and is as follows :—

“I have now examined the books of Mr. C. S. Bensted’s business, at No. 10, New Broad Street, covering the last 10 years, and find a good increase shown since its commencement, and that the returns for the year 1889 exceeded those of any previous year.”

With strange oversight he does not state what the returns were for previous 10 years, and he is dumb on the subject of profits, and also whether upon a capital of 7,500*l.* there would be any profit at all. Mr. Bensted is magnanimous to those who have already placed themselves in that most uncomfortable of all seats under even the best of circumstances, which he terms his “dental chair.” They have the opportunity of becoming first subscribers, but should they not feel disposed to apply for shares themselves, they may, he says, hand on the application form to a friend. If ever there was a case in which the exclamation was true, “Save me from my friends,” surely this is one.”

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

WE have received samples of Caulk’s Filling Materials. His “Improved White Alloy, especially adapted for the front of the mouth,” the “Par-excellence Alloy, (Gold and Platina)” and the “Diamond Cement.” It is impossible, of course, to judge of Amalgams at short acquaintance, only a prolonged

use will show up their merits, and (if they possess any) their demerits. But we may say that these work nicely, set quickly, take a high polish, and we could see no reason why they should fail. Perhaps the most readily noticeable point about the Diamond Cement is the slowness of its setting. This is a distinct advantage in all cases of fixing crowns or other artificial work and when lining cavities, moreover, in ordinary fillings, it can hardly be said to be a disadvantage, since it sets hard enough to cut and polish during quite an ordinary sitting. It is nicely packed in cases, four shades of the powder and a large bottle of the liquid. By the bye, it would be a great advantage if the powdered colour were sent, letting the operator mix for himself, as required, instead of oxide and colour ready mixed, and we should like to ask why manufacturers do not sell the powder without the liquid, and *vice versa*? The two rarely get used up at the same time, often the liquid is spilt, etc., etc.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The Ordinary Monthly Meeting was held May 5th, 1890, Mr. Felix Weiss, L.D.S. President, in the Chair.

The minutes of the previous meeting having been read and confirmed, Mr. Denison Pedley, M.R.C.S., L.D.S., signed the Obligation Book, and was formerly admitted a Member of the Society by the President.

Messrs. Charles Frederick Rilot, M.R.C.S., L.R.C.P., L.D.S. Eng., 44, Gloucester Place, Portman Square, W.; J. O. Butcher, L.D.S. Eng., 26, Harley Street, W.; John Greenfield, L.D.S. Eng., 11, Brook Street, Hanover Square; Robert Wynne Rouw, M.R.C.S. L.R.C.P., L.D.S. Eng. 65, Harley Streer, W.; James Frank Colyer, M.R.C.S. Eng., L.R.C.P. L.D.S. Eng., Hazeldene, Thurlow Park Road, West Dulwich; were balloted for and elected resident Members of the Society.

The Librarian (Mr. ASHLEY GIBBINGS) stated that he had

received a book and a pamphlet from Professor Guiseppi Cali, of Naples, on "The Pathology, Therapeutics, and Hygiene of the Mouth and Teeth" (*Sulla Patologia Terapia ed Igiene del Vestibolo della Bocca e dei Denti*), also "The Year Book of the Scientific Societies" and "Il Policlinico," a new periodical published at Turin.

The President then called upon Mr. T. G. Read to read his communication on "A Method of Making an all Gold Crown, illustrating a convenient way of Obtaining and Using a Model."

A suitable model is most useful when crowning bicuspid and molars, and in some cases incisors and canines.

The method to be described is, in my opinion, less painful than those ordinarily practised; a great part of the work is done in the absence of the patient; the metal band of the crown is roughly adapted to the stump, and feather-edged previous to fitting in the mouth; the portion passing under the gum is the same relative distance beneath it around the stump, and a very perfect occluding surface is obtained. When about to crown a stump, first, if possible, adjust the rubber-dam and fill the pulp canals, then reduce the broken-down crown in height to allow for restoration of the occluding surface, the stump being left standing as high as possible above the gum. Should much tooth tissue have to be cut away, and especially where the adjacent teeth are close, a long file cut fissure bur with a chisel point is very useful; two holes are drilled with the point from the labial to the lingual surface, one at the mesial, the other at the distal part of the crown; the tooth substance between these holes is cut away with the fissure part of the drill, then one blade of a pair of excising forceps is placed in the labial and the other in the lingual opening, the handles are pressed together and the crown comes away.

Small pieces of upstanding tooth substance close against another tooth may be readily removed with a wheel bur, such as Dr. Horatio C. Meriam's; these projections can be cut off from the inside without wounding the gum, and the unpleasantness of running a corundum wheel in the mouth is avoided.

Now make the side of the stump as far as the band is to extend quite parallel, so that the crown may fit the stump closely and tightly like the lid of a tin canister. Previous to paring the stump, cocaine in the crystals is rubbed on the gums with the finger, then by a drawing to and scraping

motion with Dr. Daniel F. Whitten's broken back, and Dr. Bennett's Nos. 5 and 6 chisels, the enamel and overhanging, or projecting tissue of the stump, is stripped off. The sides of the stump, having been pared quite parallel, should be finished smooth by carefully passing a safety point shouldered fine file cut fissure bur around it. Take a strip of thin metal, telephone plate answers well, trim and bend this to the stump; when roughly fitted press a small piece of softened composition to the band and stump, the patient then closes the mouth, biting into the composition; as soon as it is hard remove the impression and little band from the mouth.

Cast a lower and upper model from this with the little band *in situ*, now you have the occluding and adjacent teeth and the stump with the little band on, showing the position of the gum edge around it. Over this band make the metal band of the crown in coin gold (size 5) to fit it and correspond to the gum edge—the join should be at the lingual surface. Having fitted the band to the model, soften the end of a stick of composition and press the band on with the edge to go under the gum uppermost, this is feather-edged with a fine round file.

Take a piece of coin gold of the same substance as the band, and in Messrs. S. S. White's die plate strike up cusps for the crown. Try the struck up cusps to the occluding model and see if the bite will ride. Mark where it will, place the cusps on the male die of soft metal used to strike them up, and with blunt punches knock down those places marked; the articulating surface is thus made perfect.

File up some solder and mix it with a little Parr's flux, fill the interior of the cusps rather full and flow the solder over a bunsen flame. Now see the patient, and fine fit the band on the stump, when this is accomplished solder it edge to edge over a bunsen flame, using binding wire as a clamp.

Then with contouring pliers contour the band. If the canals have not been filled twist a piece of binding wire with a bead or two upon it, round the contoured band, place this on the stump and use it to hold the rubber-dam. Soften the end of a stick of composition, and press the band upon it with the occluding edge uppermost, with a fine flat file, cut the surface flat, remove the band from the composition, and try it and the cusps in the mouth, removing and replacing it upon the stick to cut away until the cusps are let in and the occlusion is perfect.

Now place the cusps upon a soldering gridiron, borax the

edge of the band, and adjust it in position on the cusps, so that when the shoulder that is on the cusps is cut away the buccal and anterior surfaces will be perfect; hold the work over the bunsen flame, and the solder in the cusps will melt and unite with the band.

When soldered, if the lingual and posterior surfaces are not perfect, build them up with coin gold scraps and solder fillings, run the solder with a blow pipe.

Boil in acid, trim with a fine corundum wheel and polish, having the crown on a stick of composition. Horizontally groove the pulp chamber, dry it out, and fill it and the interior of the crown with oxyphosphate of a creamy consistency, press the crown on the stump with a notched tooth-brush handle.

Strike the tooth-brush handle once or twice with a lead mallet to expel any surplus of cement. When the setting is hard trim away any excess of cement with a broken back chisel. The mallet is only used in the final stage, as the band can always, if properly made, be pressed on the stump with the finger.

Mr. WALTER H. COFFIN remarked that in reading a communication with the rapidity that the one they had just listened to had been given to the meeting, it was quite possible to overlook some points. The only new point which he had been able to see was the fitting a base metal immediately, and adapting around that the permanent gold crown, which would of course be too large, and then have to be closed up in the mouth and soldered. It seemed to Mr. Coffin that the fitting of the permanent gold crown of the stump could be accomplished in the first instance as easily as in any other metal; he imagined, however, that Mr. Read found it more convenient to handle some other metal in the initial stage.

Mr. READ said the telephone plate band is not fitted to a nicety, but only roughly. It could be done in about three minutes. Then the band is cast in an impression, and an assistant could get the gum edge right. One advantage was that an assistant could do the work which would otherwise have to be done by the practitioner. Then the point was to get the gum edge right. In the specimen he had passed it is very shallow on one edge and deep on the other. It would be very difficult to make it any other way.

Mr. HARRY BALDWIN then read the notes of a case of Hyperostosis of the Upper Jaw. He said:—The case to which I desire to call attention is that of a woman aged

thirty-nine, unmarried, the greater part of whole upper jaw was affected by a chronic bone enlargement. There is nothing in the family history to account for it. Both parents are alive, and, I should say, unusually healthy. There is no history of any constitutional taint as far back as the family can be traced, viz., to the great-grandparents, excepting that one of the mother's brothers,—one cut of a large family—died of consumption. The patient has a sister, however, who is at the present time suffering from malignant tumour of abdominal viscera.

The case has been under my observation at different times during the space of the last eight years. At the commencement of that period I had occasion to examine the mouth with reference to a small plate the patient was wearing. At that time the condition of the mouth was as follows :—The patient was wearing a partial upper plate of silver, carrying the two central incisors and the first bicuspid on each side. The right canine and right second bicuspid were still standing and healthy. The plate was attached by a wire to the right second bicuspid. The stumps of the left canine and lateral incisor were present. The rest of the upper jaw was edentulous. The left alveolar process in the molar region was considerably enlarged. The portion containing the two stumps was also considerably enlarged, the portion corresponding to the missing right lateral incisor slightly. All these enlargements were seated on the outer side of the alveolar process, but the largest one—that occupying the molar region on the left side—extended a good deal downwards as well as outwards. All the enlargements were painless, rounded with ill-defined edges, quite hard on pressure, and covered with thin, pale, smooth gum quite healthy in appearance. The patient was unaware of anything wrong. At this time I formed the opinion that an operation would eventually become necessary.

During the next four years the condition remained practically the same ; the masses enlarged slightly. At about the end of this period I extracted the two stumps, which came out easily, and gave the sensation of being implanted in something more soft and succulent than normal. Observation of the case some time afterwards gave me the impression that extraction of the stumps had rather stimulated that portion of the growth which had immediate relation with them.

During the next three years the various enlargements gradually increased in size.

During the next year, which was the seventh from the commencement of my observations, the growth made considerably more headway, and the mucous membrane over the enlargements became pencilled over with small superficial blue veins, which ran up on the labial surface vertically. The more rapid increase, and the appearance of the blue veins, which I interpreted as showing greater activity of circulation, made me decide upon operation for the removal of the growths at an early date.

Mr. Pearce Gould now saw the case and kindly consented to admit the patient into Middlesex Hospital and operate at once.

The condition of the mouth at this time was :—The lower jaw was perfectly healthy. Of the lower teeth only the front ones were remaining, and the edentulous alveolar process behind them on each side showed rather more absorption than is usual. The upper jaw still presented the two teeth, right canine and right second bicuspid, firmly implanted and healthy.

The alveolar process of the upper jaw behind the right second bicuspid was normal. The remainder of the alveolar processes presented a general enlargement, chiefly in an outward direction and downwards, but the enlargement was much more marked in the situations corresponding to the three primary enlargements first noticed, and at another spot, viz., in the incisor fossa of the root of the nose.

The swellings were all still rounded and ill-defined, especially where they joined the bodies of the maxillary bones and malar process. The largest mass, that occupying the molar region on the left side, measured vertically from its lower margin to a line drawn through the top of the concavity of palate, one-and-a-quarter inches. Its general breadth at the base also measured about one-and-a-quarter inches. This mass impinged on the shrunken edentulous gum of the corresponding part of the lower jaw when the mouth to speak.

The mucous membrane was still perfectly healthy, except the blue veins. The lips and cheeks corresponding to the growths were markedly bulged out, and the enlargements near the front of the mouth were plainly visible to the observer when the patient opened the mouth to speak.

The nasal processes of the superior maxillary bones up to the inner angle of the eye were more prominent than is usual, though the patient assures me they had always been

so, and the whole middle portion of the face was more prominent than is usual, giving the patient a decidedly plain appearance; but this appearance dated, at any rate, from many years before I had the case under observation.

We could not arrive at a decided opinion whether this was a case of exostosis or hyperostosis. It was evidently a bony tumour by its hardness, and could not be malignant because of its slow and painless progress, absence of cachexia, absence of enlarged glands, &c.

Permit me here to observe that exostosis of the jaws, along with the other facial and the cranial bones, is almost always of the dense ivory-like variety, and is formed by layer after layer of bone being deposited in an outward direction by the periosteum.

Hyperostosis, I take it, signifies an enlargement of a bone generally, where the whole bone, or parts of it, are bulged, and constantly grow bigger without that regular deposit of layers of compact bone by the periosteum, which is characteristic of ivory exostosis, and without deposit of cancellous bone by a superficial layer of cartilage, which is characteristic of spongy exostosis.

If the tumour in question turned out to be a case of exostosis it would probably be ivory-like in density, and exceedingly difficult to remove. To meet this contingency I had an extra strong head and fittings made to a Bonwill engine—driving large pointed spear-drills, long and short, large fissure and rounded burs, long and short, and a circular saw.

Mr. Gould on undertaking the case kindly agreed to call upon me to use my engine and drills if needed. The operation was performed at Middlesex Hospital on December 14th, 1889. The patient was put under chloroform. Mr. Gould then made an incision along the whole edge of the growth through the gum, and separated it from the bone with a raspatory. He proceeded with bone-cutting forceps, and at once found the tumour to consist of perfectly spongy bone quite easy to remove. The masses were then cut away piecemeal with the forceps. The two remaining teeth were removed by the bone-cutters, together with the portions of growth in which their roots were imbedded. The hæmorrhage from the spongy bone was very free indeed, but was comparatively easily stopped by firm pressure with sponges. The flaps of gum were brought together and retained by several sutures. The operation lasted about one-and-a-

quarter hours. Afterwards the patient felt very little pain or inconvenience—indeed she affirms she felt no after-pains what ever—and left the hospital at the end of the week with the gums to all appearances healed.

The further history of this case will be highly interesting, as showing, first, whether the growth is permanently checked; or, secondly, whether it is only a first instalment, so to speak, of a general overgrowth of facial bones, or leontiasis, which ultimately produces frightful deformity, attacking one bone after another and becoming entirely beyond treatment; thirdly, whether a plate with artificial teeth upon it will be tolerated and worn with good effect.

The unfavourable elements in the case are—first, the undefined character of the base of the tumour, which rendered the entire removal of the enlarged bone absolutely impossible, especially at the root of the nose and left malar process. Secondly, the doubtfully significant protrusion of the nasal processes of the superior maxillary bones, and the very chronic prominence of the middle portion of the face, which, as I have indicated, may be a forerunner of leontiasis.

The naked eye inspection of the bone which was removed showed it to be cancellous throughout, with large spaces scattered here and there, which had so globular a form, and were lined by so smooth and shiny a membrane as, I think, to justify their being called small cysts.

The sections under the microscope are taken through the canine tooth and the portion of growth adjacent to it. The growth is seen to consist of an irregular network of bone, the interspaces are filled by soft tissue consisting of white fibres and cells. The cells are fairly numerous in parts, are branched and contain large deeply-stained nuclei. Secondly, the remaining interspaces are lined by a thin fibrous membrane and present an actual space. These, I take it, were filled with fluid during life, and correspond to the large cavities which were plainly visible to the naked eye in the larger portion of the growth.

Sufficient time has not yet elapsed since the operation to say decidedly whether any further enlargement of the bone has taken place.

One of the most interesting features of the case lies in the fact that the pressure of the artificial teeth had not by any means initiated or irritated the growth; but, wherever they rested, had positively exercised a most marked influence in

preventing it. Those parts of the alveolar process where the four porcelain teeth rested, viz., the region of the two upper central incisors and first upper bicuspid on each side, were for years perfectly free from the growth when it had attacked nearly all the intervening parts, and up to the last were far less affected than the intervals where no pressure was exerted.

The President then called upon Mr. J. Howard Mummery to read his paper. [See page 578.]

DISCUSSION ON MR. MUMMERY'S PAPER.

The PRESIDENT said they were greatly indebted to Mr. Howard Mummery for his very lucid and able paper, and for the beautiful illustrations, and invited comments upon the paper.

Mr. F. NEWLAND-PEDLEY said he was able to confirm, from his own experience, the value of the process which Mr. Mummery had described, but like many other things it was of some antiquity, being known for the last fifteen years. Some five or six years ago one of his colleagues at Guy's wished to investigate the development of "rider's bone," and it was necessary to show hard and soft structures at the same time. He (Mr. Pedley) cut sections by Mr. Mummery's method, and they were shown at the Pathological Society.

Mr. H. BALDWIN wished to ask Mr. Mummery whether the transparent portion which intervened between the dark layers was chiefly formed of the unstained portion of the odontoblast cell, and whether the dark layer did not consist of the nuclei only of the odontoblast? Also, whether the so-called spaces were not unstained portions of the cells? Again, as to the small agglomerations of cells which were found in the periosteum, and which were said by some to be epithelial pearls, whether there was not some stain which would show whether they were of an epithelial nature or not?

Mr. ARTHUR UNDERWOOD said if it would not be taking a liberty to relieve Mr. Mummery of the trouble, he would take upon himself to answer two of the questions. If the parts were stained with gold the whole cell becomes perfectly stained, and the interspaces are quite marked, and that without confusion of substances; still more the transparent layer with lines between the cells is marked out quite plainly,

being in no kind of sense a part of the cell—there could be no kind of confusion—there was no doubt that an interval does exist. Mr. Underwood thought that they ought really to feel very much indebted to Mr. Mummery for his epoch-making paper in dental microscopy. Though Mr. Pedley seemed to have been so happy as to have hit upon the same process a long time ago, still it had not become public property until that evening. All dental microscopists would feel under a great debt of gratitude to Mr. Mummery for having solved the difficult problem how to cut hard and soft tissues together, leaving them undisturbed by the influences either of the knife or the fluids. Mr. Underwood knew from experience how ready critics were to assert that the appearances were due to decalcifying fluids. He thought a tablet should be raised to Mr. Mummery for having delivered them from these tiresome critics.

Mr. CHARLES S. TOMES wished in endorsing Mr. Underwood's remarks to emphasise the fact that Mr. Mummery had been the first to produce preparations which would go very far towards necessitating a revision of much that had been said and written on the question of the development of dentine. The points in question Mr. Mummery had hardly touched upon, because until he had thoroughly worked the subject out he very rightly did not wish to say anything he might have to recede from. Mr. Tomes would not have said anything about it had not Mr. Mummery confined himself very much to the exhibition of the process, and had not Mr. Pedley said that the process was not very new, thereby implying that it was not worth while demonstrating what the process could do. This much he would assure Mr. Pedley that Mr. Mummery's preparations were entirely novel to him (Mr. Tomes); they showed things in a manner which he had never seen approached, and he felt sure they would give some results which would necessitate a great deal of re-writing.

Mr. GEORGE CUNNINGHAM desired to call attention to the fact that the photographs were all the work of Mr. Mummery himself, so that he was not only an able microscopist, but also a photomicrographist who might vie with Mr. Andrew Pringle, who had been described as *facile princeps*.

Mr. CHARTERS WHITE felt that he ought to add his testimony in favour of Mr. Mummery's very able paper. He (Mr. White) had been reading for the last thirty years on the subject of microscopy and photomicrography, and had

made the subject a special study, but he was bound to say he had never been so fortunate as to reach the process before. Decalcification of the bony tissues resulted in the destruction of the shape of the cells, and the presence of acid in the pulp makes them very difficult to stain. Mr. White felt that Mr. Mummery had given the death knell to the decalcification of the tissues, and he would for one adopt the process new to him, because he felt it was capable of giving details which decalcification had never yet afforded. He would like to ask Mr. Mummery if the sections could be rubbed down in the manner in which he (Mr. White) had always described for dry sections, because in that way it would be possible to get photographs much clearer and sharper.

Mr. W. HERN wished to ask Mr. Mummery if he could explain how it was that after a process of prolonged and powerful heating, soft tissue—which was known to contain a large percentage of water—seemed to occupy the same space?

Mr. CHARTERS WHITE, if he might be allowed to reply, thought that the use of the corrosive sublimate as a fixing agent, and then afterwards the hardening in absolute alcohol, prevented any further change. The soft tissue being saturated in Canada balsam, Mr. White did not see how it was possible for the real histological elements to alter.

Mr. HOWARD MUMMERY, in reply to Mr. Pedley, was not aware that the process had been really well known before, although of course there had been hints of it. To Dr. Weil he thought belonged the credit of bringing it out properly and giving all the minute details necessary for practical working. Mr. Baldwin had already been answered by Mr. Arthur Underwood so ably that Mr. Mummery felt it unnecessary to add anything upon the points which he had raised. He quite agreed with Mr. Underwood that the spaces between the odontoblast layer and the fully calcified dentine are not part of the cells; if Mr. Baldwin would look at the specimens under the microscope he would see that. Mr. Mummery wished to thank Mr. Tomes for his kind remarks. He quite agreed with Mr. Charters White as to the evil effects of decalcification, and thought that the specimens might be cut down by Mr. White's method, though as he was only feeling his way he had not yet adopted it. In reply to Mr. Hern, he would say that the spirit takes the place of the water, and the gradual increase in the strength of the spirit prevents shrinking of the tissues. The addition of the

balsam solution in graduated strengths drives out the spirit, the balsam taking its place. The slow substitution of one reagent with another—together with the very important fixing of the fresh tissue with sublimate—is the main principle of the process.

The PRESIDENT did not know that it was necessary to add anything to the applause and hearty recognition which Mr. Mummary's paper had received. It was a great advantage to the Society, the profession, and the rising generation that they had men among them of the ability and the inclination to bring forward the result of their researches in such a manner as had been done that evening.

The meeting closed with the usual votes of thanks.

It was announced that at the next meeting of the Society, Mr. Leonard Matheson would read a paper on "Some Practical Points involved in the relation of the Upper to the Lower Teeth," and Dr. Silk a short paper entitled "Notes on a series of 1,000 Nitrous Oxide Administrations recorded systematically." Casual Communications by Mr. Sidney Spokes "On a Case of Faulty Enamel"; by Mr. Alfred Smith "Notes on a Case of Epulis."

Dental News.

THE PRIZE DISTRIBUTION AT THE CHARING-CROSS MEDICAL SCHOOL was held on the 18th June, when the Rev. S. F. Cumberlege, rector of St. Pauls, Covent-garden, presided, and presented the prizes. The school was stated to be in a flourishing condition, there being 33 general, 24 dental, and 13 occasional students. In the "service" vacancies their students had been more than usually successful. In Dental Surgery the first prize was awarded to W. May, the second to T. Coysh, and a certificate to C. Schelling. We are all glad to note the names of dental students among the prize winners in general subjects.

ROYAL COLLEGE OF SURGEONS, ENGLAND.—The following gentlemen having passed the necessary examinations were at the meeting of the Council on June 12th admitted Licentiates in Dental Surgery :

W. R. Barrett, 25, York Place, Portman Square ; H. R. Bowtell, 146, Richmond Road, Hackney ; E. H. L. Briault, 30, Richmond Crescent, N. ; A. J. Cardell, 23, Victoria Road, Clapham Common ; H. C. Carter, 181, Edgware Road, W. ; A. B. Cox, M.R.C.S. Eng., Middlesex Hospital ; E. C. Davids, 30, Monmouth Road, Bayswater ; A. H. Derwent, 10, Park Terrace, Moss Side, Manchester ; H. L. Hayman, Clevedon, Somersetshire ; G. Hern, 12, Hamilton Road, Ealing ; A. W. W. Hoffmann, 16, Beauclere Road, W. ; J. B. Horden, Spencer Villa, Leamington Spa ; W. D. Moon, 85, Newman Street, W. ; J. P. Oliver, 121, Queen Street, Cardiff ; E. J. Preedy, 360, Camden Road, N. ; S. W. Read, 30, Finsbury Square, E. C. ; S. Read, 12, Old Stein, Brighton.

By a new regulation recently made by the Senate of the University of Vienna, students on matriculating must present the Dean of the Faculty, which they wish to enter, with their photographs. These works of art will be used to identify candidates when interesting questions as to "signing up," etc., arise.

THE Committee of the Berlin International Medical Congress has decided to give their guests a grand farewell banquet, at an estimated cost of 15,000 marks (£750), and a Ladies' Committee has been formed to provide for the comfort and amusement of the wives of foreign practitioners during their stay in the German capital. It is also proposed to give members an opportunity of getting a glimpse at current Journals by instituting a Journal Reading-room. All Journals being asked to send copies of this year's issues.

At a recent meeting of the Council of the Royal College of Surgeons of England, it was announced that W. A. Winterbottom had resigned his appointment as member of the Board of Examiners in Dental Surgery. The vacancy will be filled at the next quarterly meeting in July.

THE returns of the collections on Sunday, June 8th, for the Metropolitan Hospital Sunday Fund, show that St. Jude's, South Kensington, again heads the list, with a collection of £1257. 3. 3 ; St. Michael's, Chester Square, is again second, £1106. 3. 6 ; whilst Christ Church, Lancaster Gate, £1016. 17. 6 is not a bad third. These all show an increase

on last year. No other collection amounted to over £450. There are some serious drops—Christ Church, Hampstead, from £626. 7. 5 to £197. 5. 5. Holy Trinity, Kilburn, from £263 8 7 to £57. 11. 0. Metropolitan Tabernacle, £263. 8. 7 to £175. 9. 6. Nevertheless we are glad to say the total amount exceeds that of last year by about £2000.

ON TUESDAY, June 17th, Arnemann, the German Dentist, (so-called), who was recently convicted for attempted murder of Judge Bristowe, committed suicide in Leicester goal. The *Leicester Daily Post* states that:—He was in his usually good spirits on Monday, and when visited in the ordinary course by the warder in the evening, he was all right, and was locked up for the night. Nothing more was heard of him till six o'clock on Tuesday morning, when on first official visit to the cells, Arnemann was found to have hung himself to the ventilator of his apartment. He had apparently stood upon his stool, attached his braces to the bars of the ventilator, and tied them round his neck, and then kicked the stool away. He was quite dead when found, but from the condition of the body life had apparently not been long extinct. The deceased was 41 years of age. At the inquest held June 19, the jury found that deceased committed suicide by hanging himself, the evidence being insufficient to show the exact state of his mind at the time.

WE are glad to see that Judge Bristowe has now resumed his duties.

MR. BARKLEY, for 20 years Dental Surgeon to the Worcester Infirmary has resigned the appointment. He was appointed to the Consulting Staff, as a recognition of his past services.

THE SELECT COMMITTEE ON HOSPITALS.

At the eighth meeting, Sir Sidney Waterlow's examination continued. He was thoroughly satisfied the system of inquiry at St. Bartholomew's, had prevented persons coming whose positions, would show they ought not to receive gratuitous treatment. With reference to the Hospital Sunday Fund, last year collections were made in over 2,000 churches and chapels in the metropolitan area. The council were not

very strict as to the area within which the collection was made. The first collection in 1873 was £27,700, and that of 1889 resulted in £41,740. The public confidence in the fund, he believed, was increasing, because the money was divided according to the needs and merits of the respective institutions. Sir Sidney stated that two institutions did not last year receive a grant, and several other hospitals declined to send a deputation to have their accounts audited. The Council had indirectly endeavoured to discourage public support of special hospitals, unless they were particularly entitled to help. The fund collections had not, he thought, caused a decline in the other charitable contributions to the hospitals. It was unwise to have the two systems of free and paying patients being treated at the same hospital. He was afraid there was a tendency to extend the hospital accommodation without any actual necessity. Whilst the extension of the power of the Charity Commissioners to other general hospitals would tend no doubt to the uniformity of accounts, he did not quite see why persons spending their own money should be compelled to render account to those whom they had no relation.

Dr. Steele was re-examined with the view of correcting and amplifying some of his previous evidence relating to the government of Guy's Hospital.

At the ninth meeting. Sir Edmond Hay Currie, who was re-examined, said that, in his opinion, it would be better to have a central university for medical instruction, from which students would go to the hospitals for clinical instruction, than as at present having a school attached to various general hospitals. The present system of lectures was not entirely disinterested—it was done for fees. He should like to see London divided into different districts, so as to connect the hospitals with the sick asylums and the parish infirmaries. He thought the charitable people would take even greater interest in the hospitals if they were grouped. The public were pretty good judges, and did not give much support to institutions which were rotten. The hospitals, with few exceptions, were within a small area around Charing Cross, and they would be of infinitely greater use if several could be removed—say, one to the north and one to the south of London. The present system of election of the medical staff was altogether very peculiar, and a reform would be desirable in the interests of everybody. He should be very sorry to

see any hospital built with anything like 500 or 600, beds in future. He should like to see something like a hospital clearing house. On the suggested central board he should like to see the medical and lay members working together. There should be a different system of electing the medical staff, and he would not confine the appointment to members of the London colleges. If the London hospitals were to be moved, he hoped they would be moved, not into the country, but into those metropolitan districts where the poor lived. He was in favour of a central body, composed of medical and lay representatives of the hospitals, of the Government, and of the poor—having power to distribute the patients into various hospitals. He did not consider that such a central body would have a corresponding paralysing effect on individual efforts. The provident system in connection with hospitals he considered the most important question of the day for London poor. There was no necessity for the big out-patient departments. The present choice which the poor possessed of going to any hospital was now used vexatiously. The hospitals were not in sufficient touch with each other. Every hospital should have affiliated to it a certain number of dispensaries. Whilst very anxious for the poor they must take care not to ruin the medical men. He was in favour of hospitals being provided by private endeavour rather than by Government. There should be a certain number of small hospitals outside London, where there would be a better chance of life than in the vitiated atmosphere of some of the London hospitals, but they should be part of some general hospital.

Sir HENRY LONGLEY, K.C.B. (principal Charity Commissioner), explained that the Commission was established in order to exercise, in a semi-judicial way, the functions of State control, which up to that time had been exercised by the Court of Chancery, which was intermittent and involved long delay. They were appointed as the result of the long inquiry known as the Brougham inquiry. As to its powers, the Commission's functions were more judicial than administrative, for they acted only when called upon to do so. An important duty was the sanctioning of sales, leases, and mortgages, and of appointing trustees. These powers extend to all hospitals, except so far as they are supported by voluntary contributions. Those supported in that way were exempt from the Commissioners' jurisdiction. He then spoke of the extent to which the leading hospitals were supported by endowment.

It was not correct for persons to speak of Guy's, St. Bartholomew's, and St. Thomas's as the only endowed hospitals in London. The Commissioners had power to invest real and personal property, and St. George's Hospital was in the habit of entrusting the Commissioners with considerable funds for investment. Guy's Hospital applied to the Commissioners and obtained authority to appeal to the public for £100,000. That amount was obtained, and thus the capital had been saved. They also obtained a scheme for taking paying patients, the Commissioners sanctioning the modification of the terms of the trust. They could not have sanctioned a new scheme for Guy's unless the majority of the trustees had memorialised. The case of Guy's was a special one, because of the failure of the endowment to do what the founder wished, so that the Commissioners had power to frame a scheme without going to Parliament. The Commissioners had never required uniformity of accounts; so long as they were clear. Mr. Hayter (of the Commission) had examined the accounts of the endowed hospitals in London recently, and he reported: "The accounts of all were rendered in a form not difficult to understand, and would probably be regarded as sufficient for the purpose of those members of the public who would be likely to examine them."

At the tenth meeting Mr. Cottenham Farmer, M.R.C.S., general practitioner, was examined, and, in reply to the Chairman, stated that he practised in close proximity to the Royal Free, Central London Ophthalmic, and the Central London Throat and Ear Hospitals. He considered the enormous competition at the free charities reduces the medical practitioners to a very low level. And in regard to medical science the reduction of the fees must naturally cause very bad treatment. Dr. Bridges, in his report in 1878, after the system of inquiry had been instituted, stated that he saw patients at St. Bartholomew's at the rate of about one minute and a quarter to each, and in that time he had to make a diagnosis and select the cases. Speaking with regard to the experience of dispensary work, the Witness said that for years he had a dispensary, and he never had a case which he could not treat. The great majority of the cases which went to hospitals were of a trivial character. With respect to district nursing, the Witness said that if the system were extended, that system would replace the out-patient department of hospitals in a great measure, if the general practitioner rose to

the same level ; but, owing to the competition of the hospitals, that rising was impossible. While many persons abused the hospital system there were many poor persons in great need of relief and could not afford to pay. They should have the option of going to the hospitals which were built for them, or they could go the Poor-law as a right. He thought about 90 per cent. of the cases which went to the out-patient department had no right to charitable relief. If the infirmaries, in addition to the chronic cases, had medical and surgical cases, it would be necessary to double or treble their accommodation. But he was not complaining so much of the in-patient as of the out-patient departments. He thought the system in force in Vienna and Berlin, of having three classes of patients—the first luxurious, the second less so, and the third very poor—was applicable in England?—He would like to see the staff paid?—He objected to paying hospitals. Persons who could pay should go to their private medical attendant, and they would get much better attention in their own houses as a comparative stranger at a paying hospital.

Mr. Frederick Henry Corbyn, M.R.C.S. Eng., L.R.C.P. Edin., general practitioner, had not applied for an appointment at any London Hospital, but had he done so the fact that he held an Edinburgh diploma would have been a bar. He believed that the local medical practitioners as a body attributed the reduction to the competition of the hospitals. He was in favour of medical clubs, and of every sort of provident scheme. The general hospital did much good, it was the out-patient department which required reform. He was not complaining against the managers, but of the system. He was in favour of abolishing the out-patient departments of hospitals, except the special departments. He was not quite sure that the immense competition between the out-patient departments of hospitals, the provident dispensaries, the part-pay hospitals, and the practitioners, although it had lowered the fees of the private practitioners, had not been a gain, because at one time those fees were such as to drive persons to get free relief. Now that those fees were reduced the people were coming back.

Mr. Lennox Browne said he had had twenty-five years' experience in connection with special hospitals. He opposed Sir Edmund Currie's provident scheme, because patients ought not to pay in sickness and in health. He explained the system of part payment adopted at the Central London Throat and Ear Hospital, and said that it had paid off a loan and be-

come absolutely solvent partly as a result of the payments from patients. The cost of maintenance was less than at many hospitals, and the average cost per bed was £80 and not £96 as stated by the Charity Organisation Society. Special diseases were better treated in special than general hospitals. He had a list showing that over 150 physicians and surgeons at general hospitals were consulting or actual officers of special hospitals.

THE GENERAL MEDICAL COUNCIL. DENTAL BUSINESS.

Mr. MACNAMARA put to the President the following questions :—

(a) "That whilst recognizing the fact that such are not registrable in the *Medical Register*, he will ask the President whether titles conferred by the several Medical Authorities subsequent to the passing of the *Medical Act* (1886), but not conferred in accordance with the provisions contained therein, said titles being conferred on Registered Dentists only after *bonâ fide* examination, are or are not registrable in the *Dentists' Register* as 'additional qualifications' under the provisions of Clause 6 of section 11 of the *Dentists' Act* (1878) which runs as follows :—

'The General Council may, if they think fit, from time to time make, and when made, revoke and vary orders for the registration in (on payment of the fixed fee by the orders) and the removal from the *Dentists' Register* of any additional diplomas, memberships, degrees, licences, or letters held by a person registered therein, which appear to the Council to be granted after examination by any of the Medical Authorities in respect of a higher degree of knowledge than is required to obtain a certificate of fitness under this Act.'

(b) "That he will ask, through the President, whether it is or is not, the opinion of this Council that, with the object of raising the status of Registered Dentists, facilities should be afforded them of obtaining such additional titles after sufficient examination."

The President answered.

The Registrar read the report which was as follows :—" (a) Acting on the powers conferred by the cited Section of the *Dentists' Act* (1878), the General Council, on April 28th,

1881, (Minutes, vol. xviii., p. 82), resolved that every registered dentist holding any of the surgical qualifications set forth on Schedule A. of the Medical Act (1858) should have such qualification or qualifications recorded in the Dentists' Register as evidence of the possession of a higher degree of knowledge. Moreover, on July 8th, 1882, (vol. xix. p. 119), this right was extended by the Council to any or all of the qualifications named in Schedule A. of the Medical Act.

"Seeing, therefore, that the entry of such qualifications in the Dentists' Register confers no right to practise medicine or surgery, but merely records the possession of a higher degree of knowledge, the provisions of the Medical Act (1886) do not restrain the Council from registering in the Dentists Register the titles specified in this question.

"(b) The President put this question, to the Council itself."

Dr. GLOVER put to the President the following questions—

(a) "By what authority are Registrations under Section 37 of the Dentists' Act (1878) permitted?"

(b) "After what kind and degree of investigation is such Registration ordered?"

To these Questions the President gave the following answer:—"Every application for registration under Section 37 of the Dentists' Act (1878) is carefully investigated, and the process of investigation sometimes occupies several months. The application is required to furnish, besides other particulars, a Statutory Declaration, taken before a Commissioner of Oaths, embodying all the necessary details of the case: and in this declaration his master is required to join. A certificate of birth has, moreover, at the suggestion of the British Dental Association, been of late demanded.

"Each such application is considered by the President, and additional information, if deemed necessary, is sought for from the applicant.

"Furthermore, whenever a doubt arises in regard to any legal points in connection with such application, the case is always referred by the President to the Council's legal advisers, and is sometimes also remitted specially to the Executive Committee. An example of this may be seen on page 228 of last year's volume (xxvi.) of the Council's minutes, where it is recorded that, on November 25th, 1889, the Executive Committee directed two such apprentices to be registered.

“Applications under Clause 37 of the Dentists Act are not unfrequently accompanied by recommendations from well-known persons, either registered dental practitioners, or registered persons, medical practitioners, or even by Members of this Council itself, as, for example, one sent in on the 7th of April last, which is still under investigation.

“Vague complaints are sometimes made in regard to these special registrations, and these now and then proceed from a dental practitioner who, having himself been registered in the same way, states that the person complained of knows nothing whatever of dentistry, and goes on to request to be furnished with full particulars in regard to the application of such person. In consequence of the vagueness of such complaints, the President, on December 6th, 1889, found it necessary for the conduct of the business to the office to direct the Registrar to state that if application were made in writing by a secretary or other authorised person on behalf of the British Dental Association, an answer would be sent in each particular case, giving the information desired.

“Accordingly, on February 14th, 1890, in reply to such a request from the Secretary of the British Dental Association, the Registrar, with the President’s authorisation, furnished—in regard to what was considered as a typical case—the fullest information, including even the name of the Commissioner of Oaths, before whom the Statutory Declaration was made: but, hitherto, nothing further has been heard about the case.

“Thus, all possible care is taken in regard to applications under the said Section of the Dentists’ Act, though, in consequence of the framers of the Act having placed no limit of time to such form of registration, such applicant cannot legally be rejected, as, in fact, has been intimated by solicitors acting for certain applicants. For dentists who were in practice before July 22nd, 1878, a distinct limit of time was set forth in the Act; but in regard to these applications under Section 37, no limit whatever is prescribed in the Act.

“Of necessity, by lapse of time these applications are diminished in number. For five months past there have been received no more than ten of any kind; of these four have been summarily rejected, four have been acceded to, and two are still under investigation.”

Dr. LEISHMAN moved, “That the attention of the Executive Committee be called to the frequency with which the names of certain persons are still entered on the Dentists’ Register under Section of the Dentists’ Act, 1878.” He said

the clause referred to was that which entitled persons whose articles of apprenticeship expired before Jan. 1st, 1880, to be registered. Notwithstanding the time which had since elapsed, last year there was a considerable increase in the number of men presenting themselves for registration under this clause—in some cases men who had never been articulated as pupils or paid any premium, men who were simply workmen, who somehow or other succeeded in bringing themselves within the interpretation of the clause.

DR. GLOVER, in seconding the motion, said that last year there were twenty-nine such cases, in the year before there were twenty-four, and in the previous year nine. In the last three years there were sixty-two registered, as against fifty-seven in the three previous years, so that the number could not be said to be diminishing as time went on.

The President said of all the unpleasant duties he had to perform the duties in connexion with this business were the most unpleasant. Each individual case was investigated, and he obtained all the information which the Act of Parliament required, and which the rules of the Council required him to obtain, even to statutory declaration which he examined. What was he to do, was he to constitute himself a kind of detective policeman and send round and ascertain whether this man or the other was actually declaring and signing his name to a falsehood? If the Dental Association would bring up a case and show that a false statement had been made, something could be done, but he did not see how the Council or its registrars could make those inquiries. He did not think that because a certain number of rogues got on the Register by fraudulent statements, any sort of slur should be cast upon the mode in which the business of the office was conducted. He had no objection to the Executive Committee examining into these cases; personally he would be glad to be relieved of so cumbersome a proceeding, but they must be prepared to devote several days to the matter.

Dr. HERON WATSON thought if the Dental Association would make an example in some of the cases referred to the difficulty would be met.

This was agreed to.

WE learn that Mr. Thomas Fletcher has promised to present the Manchester Dental School annually, for five years, with Prizes to the value of £20; one of £12, the second of £8. The prizes are to be given for proficiency in operating. Mr. Henry C. Quinby promises like gifts to the Liverpool School. We hope this generous lead in prize-giving will incite others to go and do likewise.

TENTH INTERNATIONAL MEDICAL CONGRESS. SECTION.

For the information of our readers, we give, herewith, the fares to Berlin by the various Railway Lines, and also a list of the principal Hotels with their charges.

GREAT EASTERN RAILWAY—*via* Harwich, Rotterdam, Gonda, Utrecht, Arnheim, Emmerich; or, Rotterdam, Dordrecht, Arnheim, Bentheim, Salzb-
bergen, Minden and Hanover.

Time 28 hours.—Fare: 1st Class £4 3 0. 2nd Class £2 18 2.
Return „ £6 5 5. „ £4 7 9.

For full particulars see Advertisement.

GREAT EASTERN RAILWAY—*via* Harwich, Rotterdam, Gonda, Utrecht, Arnheim, Zevenaar, Elten, Cleve; or, Emmerich; or, Rotterdam, Dordrecht, Breda, Boxtel, Venlo, Kaldenkerchen, Cologne, Dusseldorf, Oberhausen, Dortmund, Hamm, Beilefeld, Minden, Hanover and Lehrte.

Time 28 hours.—Fare: 1st Class £4 19 6. 2nd Class £3 10 6.

For full particulars see Advertisements.

GREAT EASTERN RAILWAY—*via* Harwich, Antwerp, Brussels, Louvaine, Leige, Pepinster, Verviers, Herbesthel, Aix-la-Chapelle, Cologne, Dusseldorf, Oberhausen, Dortmund, Hamm, Bielefeld, Minden, Hanover, Lehrte.

Time 33 hours.—Fare; 1st Class £5 5 9. 2nd Class £3 14 9.

For full particulars see Advertisement.

SOUTH EASTERN RAILWAY OR LONDON CHATHAM & DOVER RAIL-
WAY, - *via* Calais and Brussels.

Time 26½ hours.—Fare; 1st Class £5 19 6. 2nd Class £4 8 0.
Return „ £9 14 0. „ £7 6 0.

SOUTH EASTERN RAILWAY, OR LONDON CHATHAM & DOVER RAIL-
WAY,—*via* Ostend and Brussels.

Time 26½ hours.—Fare: 1st Class £5 8 0. 2nd Class £3 19 6.
Return „ £8 13 3. „ £6 8 9.

LONDON CHATHAM & DOVER RAILWAY.—*via* Queenboro', Flushing,
and Oberhausen.

Time 26 hours.—Fare: 1st Class £5 2 11. 2nd Class £3 14 11.
Return „ £7 14 6. „ £5 12 4.

The following are a list of the Hotels in Berlin, those marked by an asterisk are first class hotels.

		Bedroom	Bkfst	Dinner	Att.
* Hotel d' Angleterre, Schinkelplatz 2.	..	2/6 to 6/0	1/3	3/0	9d.
Askanischer Hof, Königgrätzer Strasse.	...	3/0 „ 6/0	à la car	2/0	
Hotel Bauer, Ecke Friedrichstrasse.	...	2/6 „ 5/0	1/0		
Berliner Hof, Neustaetische, Kirch-					
strasse, 10.	...	2/6 „ 5/0	1/0		
Hotel Brandenburg, Charlottenstrasse, 71.	...	1/6 „ 5/0	1/0		
City Hotel, Dresdnerstrasse, 52.	...	1/6 „ 2/6	9d.	2/0	
* Hotel Central, Friedrichstrasse, 143—149.	...	3/6 „ 10/	1/3	3/6	
* Hotel Continental, Neustadtische					
Kirchstrasse.	...	3/0 „ 16/	1/3	4/0	
Hotel de l'Europe, Taubenstrasse, 16.	...	1/6 „ 6/0	1/0	2/0	
Hotel de France, Markgrafenstrasse	...	2/6 „ 5/0	1/0		
Fürstenhof, Leipziger Platz, 2.	...	2/6 „ 5/0	1/0	2/0	7d.
* Grand Hotel.	...	2/0 „ 5/6	1/0		
* Grand Hotel Bellevue, Pots-damerplatz.	...	3/0 „ 10/	1/3	2/6	
Hotel Grossfürst, Alexander, Neue					
Friedrichstrasse, 57.	...	1/6 „ 4/0	1/0	2/0	
Hotel de Hambourg, Heiligegeiststrasse,					
17—18.	...	2/0 „ 4/0	9d.		
Hotel Imperial, Unter den, Linden.	...	2/0 „ 7/6	1/0	3/0	
* Der Kaiserhof.	...	3/0 „ 15/	1/8	3/0	
Kaiserhof, Neue Taschenstrasse,	...	2/6 „ 4 0	1/0	2/0	6d.
Kleiner Kaiserhof, Krausenstrasse 67 & 68.	...	2/0 „ 5/0	9d.		
Hotel Kronprinz, Luisenstrasse, 30.	...	2/0 „ 4/0	1/0	1/6	
Hotel Metropole, Unter den Linden.	...	2/0 „ 8/0	1/0	2/6	6d.
Norddeutscher Hof, Mohrenstrasse, 20.	...	2/0 „ 4/6	1/0	1/6	
* Hotel de Rome, Unter den Linden.	...	3/0 „ 12/	1/3	3/6	
* Hotel Royal, Unten den Linden.	...	2/6 „ 10/	1/3	4/0	1/0
* Hotel de Russie, Schinkelplatz, 1.	...	3/0 „ 12/	1/3	3/6	
* St. Petersburg Hotel, Unter den Linden	...	1/6 „ 6/0	1/3	3/0	9d.
Schmidt's Hotel Zur Stedtbahn, Neustae-					
dische Kirchstrasse, 14.	...	2/0 „ 7/6	1/0		
Hotel Station, Friedrichstrasse.	...	3/0 „ 5/0	1/3		
* Toepfer's Hotel, Karlstrasse Ecke,					
Luisenstrasse.	...	2/2 „ 7/6	10d.	2/3	
Hotel Union, Jagerstrasse, 13.	...	2/0 „ 4/0	1/0		
* Hotel Victoria, Unter den Linden.	...	2/0 „ 8/0	1/3	3 to 4	
Hotel Zermickow, Charlottenstrasse, 43...	...	1/6 „ 4/6	1/0		
* Monopol Hotel, Bahnhof Friedrich-					
Strasse.	...	3/0 „ 8/0	1/3	4/0	

We would suggest that our readers apply at once to secure accommodation as already we hear the Kaiserhof, one of the best hotels, is unable to accommodate any further applicants.

The terms mentioned above are the usual charges of the Hotels, but no doubt on this occasion they will be raised.

Abstracts of British & Foreign Journals.

DENTISTRY IN HUNGARY.

Abstracts from a letter of OTTO MARX, to the
Dental Register.

THE history of dentistry in this country hardly dates back a half century. The total population at that time amounted to 16,000,000 inhabitants, and there were just two universities in the country. The one university up to 1858 only educated and gave diplomas for "surgeons" or doctors of second rank, or in other words, educated "barbers" for military service. The other university, the one in Budapest, had two sorts of diplomas—one for the barber, as mentioned above, and one for the higher class of students who received the degree of M.D. All these, however, had to be graduates of some good school or college. This, however, has all been vastly improved since the time of Marie Theresa.

To establish a department of dentistry here in Budapest, where there is a population of half a million, parliament has only appropriated 1,000 florins a year, with which to pay the one professor, assistants, and servants, besides buying the necessary outfit and other paraphernalia indispensable to a school of the most unpretending kind.

Dentistry in Hungary really takes its origin from two military surgeons who came here from Austria after the revolution of 1848. They obtained their knowledge in the office of some dentists in Vienna. The whole knowledge of dentistry here at that time consisted in extracting and substituting the natural teeth with artificial ones on metallic bases. Filling teeth was very little known, and termed by those who had heard of it as a humbug. Pest had at this time a population of 200,000 and not only these, but the whole of Hungary, depended upon these two surgeons and one barber for their dental operations.

The business of the dentist at this time was to make artificial dentures, the barber performed all the operations, and even to this day you can have teeth extracted in any barber's shop. From this it will be easily seen why "dentistry" felt

into the hands of the jewellers ; they were skilled mechanics.

In 1856, the university appointed one man, an M.D. (who, by the way, had never studied dentistry abroad and of course not at home, as there were no schools) as professor of dentistry. This gentleman up to 1883 gave courses in dentistry. These courses consisted of lectures once a week for six months; he gave these lectures not in his office but at his home. He lectured chiefly on the anatomy of the teeth and occasionally he made a plaster model. Generally his class was composed of half a dozen medical students. If any of these wished to see how a tooth was soldered to the plate, or any other work performed, he had secretly to bribe the "technicher," and so get the desired permission. So matters stood even as late as the last four or five years.

The gentleman from whom I have this information was the first to go abroad, namely, to London, and there spend a year in the dental college. This was in 1861. As the years rolled by the number of dentists in Hungary increased from three to three hundred. Of these hardly a third are doctors or graduated dentists. The most remarkable thing is the way in which the diplomas for dentistry were given out here. Any doctor or surgeon could obtain a degree of "Mogisten der zahnheilkunde" by merely passing a special examination in anatomy, in which examination, however, no mention was made of "zahnheilkunde." The state of affairs in this respect, I am sorry to say, has not improved, for even every physician is at liberty to practise dentistry if he so desires without any further hindrance. In case of a foreigner or a doctor who has received his diploma (be it M.D. or D.D.S., in another country) it is different, he has to have his diploma recognised and to pass an examination on the anatomy of the head and surgery of the mouth; of the "zahnheilkunde," proper, however, no questions are asked, because the examiner (the dean of the college) has not the faintest idea of dentistry.

TO CORRECT AN OFFENSIVE BREATH.--An offensive odour of the breath due to bad teeth or other causes may be overcome, or at least greatly abated, by the habitual use of listerine. Add a teaspoonful of water for a mouth-wash and gargle, and if a little is swallowed so much the better. Indeed, a bad breath is not unfrequently caused by the gaseous eructations of indigestion, and for this also listerine is an excellent remedy, in doses of twenty to thirty drops in a little water.—*The Sanitarian*.

Dental Hospital Reports.

MONTHLY STATEMENT of operations during May, 1890.

	London.	National.
Patients . . . . .	.	1895
Extractions	1498	900
" under Anæsthetics	875	702
Gold Fillings	356	103
Other Fillings	1277	388
Irregularities	110	168
Miscellaneous	385	249
Artificial Crowns	24	9
Total	4525	2519
<hr/>		
<i>House Surgeons.</i>	J. A. MALLET, E. PREEDY, W. R. BARRETT.	WM. FISK, ALFRED MOORE.

Monthly Statement of Operations at the Manchester Dental Hospital during April and May, 1890.

	April	May
Patients	1015	912
Extractions	578	520
" under Anæsthetics	113	163
Gold Fillings	36	21
Other Fillings	201	140
Irregularities	37	39
Miscellaneous	422	213
Artificial Crown	9	3
Total	1397	1099
<hr/>		
	<i>House Surgeon, C. H. SMALE.</i>	

APPOINTMENTS.

J. F. Colyer, L.D.S., M.R.C.S., appointed Assistant Surgeon-Dentist to the Charing Cross Hospital.

Rupert H. Cumine L.D.S.I., appointed House Dental Surgeon to the West Ham, Stratford and South Essex Hospital.

VACANCY.

The Victoria Dental Hospital of Manchester 98, Grosvenor Street, Manchester. The Committee of management are prepared to appoint a House Dental Surgeon. Candidates to send application and testimonials before the 16th August to H. L. Knoop.

ANSWERS TO CORRESPONDENTS.

Mr. WM. RUSSELL writes :—" I see an article on Impression-taking in the Journal by Mr. E. Bull, the gentleman seems to forget the difficulty in getting a true bite, how would he proceed, to get one?"—We do not, of course, know how Mr. E. Bull would proceed, perhaps he may be good enough to tell us himself? For ourselves, we know of no other method than those already the property of the Profession, used with much care and still more patience.

REV. JOSEPH WORKMAN.—The new rules for Dental Students affect only the curriculum of study and not the laws relating to the stamping of their articles. The amount of stamp duty varies with the amount of premium paid, which later would, therefore, have to be stated in the Indentures. The amount of premium, if any, is entirely a point between yourself and the dental practitioner. For these points you should consult a solicitor, though much useful information is given in Whittaker's Almanac.

"Balkwill's Mechanical Dentistry" is published by J. & A. Churchill, 11, New Burlington Street, London, W.

Mr. ARTHUR DRAKE, See Section 37 of Dentist's Act of 1878—Also discussion of the Medical Council published in this issue. You must apply to the Registrar, Medical Council Office, 299, Oxford St. London, W.

ERRATUM.

Page 575, line 3, for "two thousand," read "tens of thousands."

BOOKS AND JOURNALS RECEIVED.

British Medical, The Lancet, Pharmaceutical Journal, Chemist and Druggist, Glasgow Medical Journal, Australasian Journal of Pharmacy, Pharmaceutical Journal of New South Wales, Dental Surgery, Dental Record, Dental Cosmos, Deutsche Monatsschrift für Zahnheilkunde, Southern Dental Journal, The Dental Review, Etc., Etc.

British Journal of Dental Science.

No. 540. LONDON, JULY 15, 1890. VOL. XXXIII.

LIVING LARVÆ OF FLIES IN THE STOMACH AND IN THE ORAL CAVITIES.*

By PROFESSOR W. SENATOR.

GENTLEMEN,—

The case for which I claim your attention for a few moments, belongs to the class usually so-called "pseudo parasite affections" *i.e.*, affections which are caused by the presence of organisms, the existence of which is spent outside the human body, but which, if they happen to fall in or on to it and find the necessary nidus for their existence, remain there. Of the animal organisms belonging to this class the most remarkable are some kinds of diptera, namely flies, the *anthrax* and *musca*, especially in the form of larvæ or eggs. It is in the nature of things that they should be found principally in places easily reached, such as superficial excoriations, wounds, ulcers, as well as the terminal points of mucous membrane, more especially if they are the seat of foul smelling discharges; thus, we find in medical literature quite a mass of cases recorded, some of a most marvellous nature, of worms which have been found in one or other of these situations. It is far more uncommon, however, to meet with cases in which living worms of this kind, have been found in deeper cavities, partly because they have more difficulty in making their way into them, and also because they find less oxygen, which is also necessary for their existence. The records of cases of larvæ in the stomach belong to the greatest curiosities in medical literature. The following instance is one of them.

On the 23rd September of last year, a lithographer, aged 38, called upon me and stated that he had suffered from attacks of faintness ever since he was sixteen years old; but that in other respects, he had always enjoyed good health, believing that this tendency to fainting might possibly be caused by a tape worm. In February, 1888, after another

* Paper read at a meeting of the Physicians of the Charité Hospital Berlin.

fainting fit, he went to a well-known worm quack, who gave him a remedy for tape worm. The result of it was that he had the most violent pains in the stomach (he had taken the remedy in the evening) which awoke him at three o'clock in the morning, and caused him to vomit, and he now brought up a mass of, he believes, several hundred worms, which were alive, and crawled about the floor. Soon after this he had a motion, but did not notice any worms in it. The intestinal troubles now ceased, but the attacks of faintness recurred as before almost every fortnight. A year and a half after this event, six weeks before he came to see me, in August, 1889, he again brought up, after a simple attack of vomiting, but without any nausea, 13 more live worms. He then went to a medical man, who washed out his stomach, but no more worms came away. The whole thing was looked upon as a hoax. Acting upon someone or other's advice, he then took a sautonin powder, so as to get rid of the worms, which he thought must be lodged in the bowels, with the motions, but no more appeared.

On the 22nd of September, he again vomited worms, which he brought to me on the following day. Altogether there were over a dozen, which were still alive, and appeared like ordinary fly larvæ. There has evidently been no repetition of this accident, for he was instructed to call upon me if it happened again, which he has not done.

At the time of his visit to me, when he arrived with the worms, a careful examination of his body showed no abnormal appearances, and nothing special could be found in the throat and nose, with the exception of catarrh of the pharynx, and great dilation of the veins on the posterior wall of the throat.

In answer to repeated inquiries as to whether he had ever eaten anything which might have contained larvæ or something of the kind, he replied that the only things he had partaken of shortly before the first passage of worms, which he ascribed to tape worm troubles, were sardines, but he did not know if they contained larvæ, or whether they were in a state of putrefaction. Nothing in his ordinary food, that he knew of, could have been looked upon as the carrier of larvæ or eggs.

I handed over the larvæ for more careful examination and for the purpose of settling the exact nature of the flies to the Zoological Department of this University, which is under the management of Geheim Rath Eilhardt Schulze. From him

I received a note stating that they belonged as I thought, to the common house fly (*Musca domestica*). A positive proof of this would have been afforded by hatching a few of them, but this was impossible, as they had died in the interval. In the bottle I hand you, you will see a dozen preserved in spirit.

Now, gentlemen, before going any further into the matter, I may perhaps give expression to an opinion that might possibly be held, namely, that as the case was neither seen by me, nor especially by any scientific observer, it might be a deliberate or unconscious fraud. I think this supposition may be put aside at once, for there was not the slightest ground for his perpetrating such a hoax. I cannot see, myself, what purpose it would have served the man to concoct the whole story, and to go and collect the worms. If he had wished to make himself interesting, as might have been expected of a hysterical patient, he would surely have shown himself a little oftener. It is still less likely to have been a case of unconscious mistake, a sort of self delusion, for the whole thing was so simple as not to require any special measure to put oneself right. The most simple observation showed that he had brought up worms in large numbers, and that, as he said, he could either spit them out of his mouth, or take them out with his finger. The same mode of reasoning could, of course, be used in all the recorded cases of the same nature, of which it was stated before, there are but a very small number.

The latest, though not complete record of cases of pseudo-parasitic diptera in man is that of H. Summa,* who calls the affection "Myiosi." In connection with the occurrence of these larvæ in the human alimentary canal, he mentions a case from his own practice in which larvæ of *authomigia* were vomited, together with a case each from Elsner, Gerbardt, and the well known one of Mercheda.

To these I may add another, which I have found in Valleix.† Laboultene and Robin record an instance which came under the care of J. Dubois, of a woman in whose stools and vomited matter living larvæ of a species of *authomigia* were found. Valleix also states that larvæ of flies have been met with in the gums and inside of the cheeks of a young man in Jamaica. Summa also appears to have overlooked the very remarkable case of W. Zublinski, from the University Pole-

* The pseudo-parasitism of Diptera in man or myiosis.

† Valleix *Guide de Médecine praticien* 4 edition, Paris, 1861.

‡ *Deutschl Medicinisch Wochenschrift*. 1885, No. 44.

clinic of Berlin. In this case also, the man brought several thousand worms which he said he had vomited a short time previously, and these Dr. Dewitz, who was at that time conservator of the Zootomic institute, pronounced to be larvæ of *musca domestica*. These larvæ appear to have been met with far oftener in the fæces than in the vomited matter.

Summa states, on the strength of the cases which he has recorded, that all the larvæ of flies which have been met with in the stomach and alimentary canal belong to the order *authomigia* (namely, *canicularis* and *caniculina*), but not to the order *musca*; he considers that the recorded instances of the latter are unreliable.

The two cases observed in Berlin, that formerly by Lublinski, and the one now reported by myself, prove that Summa's views need correction in this respect.

My case is peculiar, owing to the fact that the larvæ were not only vomited like in other similar cases, but that they also crept out of the mouth, and were either spat out or were hooked out by the patient with his finger, and this not once only, but on several occasions at long intervals, a circumstance which does not help to make the explanation of the case very easy.

There is also on record another very remarkable case in which a very similar discharge of worms took place, not of the fly larvæ, but of *oneguris vermicularis*. I will take the liberty of relating this case somewhat at length, for the observation is but very little known, as it is buried in a dissertation where it is as good as hidden away, and also because but a very short extract of this, by Seligsohn, appeared in the Transactions of the Medical Society of Berlin, where it is very easy to overlook it.

This case also occurred at the University Policlinic. On the 20th January, 1878, a young girl of ten came with her mother, and stated that almost regularly every day worms appeared in her mouth between 8 and 9 o'clock in the evening. It appears that on the first occasion she complained of her tongue itching, and when her sister looked at her tongue, she noticed a number of white worms moving on it. A medical man who was consulted about it denied the possibility of such a thing. This induced the mother to bring the child to the policlinic of the University.

"In order to be convinced of the truth of her sayings,"

* Albrectht Pomper: Beitrag zur Lehre von *Vaguris vermicularis*, Berlin, April, 1875.

writes the author of the dissertation, "I went up one night at about 8 o'clock, with a colleague, Dr. Levinson, to these people's house. I was enabled to satisfy myself by personal observation, of the truth of the woman's story. I made the child sit with her mouth open, on a stool close to me, and carefully examined the whole cavity. All of a sudden, I discovered worms on the tongue moving vigorously towards the tip. The worms were removed with a small spoon, and the observation was continued. In a few minutes, more worms made their appearance, they also rapidly made their way from the root to the tip of the tongue. These also were removed, and the process of the arrival of new worms on the tongue was watched for a full hour. At the same time, I noticed that the worms assumed the most diverse and delicate shapes. Two days later, in company with the same colleague, I paid a second visit to the family, and I was able to confirm in every particular, the truth of my first observation, the appearance of the worms in the oral cavity, the two varieties of these, and their movements.

Observation showed that in this case the worms belonged to the species of *oniguris vermicularis*. The author of this observation discusses the question as to how the worms managed to get into the mouth of the child;—whether they came from the mouth or from the pharynx; and expresses himself in favour of the former hypothesis. The worms might have wandered into the stomach from the intestines, or the case might have been one of auto-infection with eggs from the mouth. How did the larvæ manage to get into the mouth in our case? There can be no doubt that originally a portion, at least, of those which the patient brought up, must have been in the stomach, and that the larvæ or their eggs must have got into the stomach with food of some kind. With regard to the subsequent masses thrown up, we may assume that most likely all the larvæ or eggs, were not got rid of with the vomiting, but that some portion must have remained and been left behind either in the stomach, from whence they made their way into the mouth by the œsophagus, or else in the pharynx or the choana. They must have remained in the form of eggs, which crept out after their metamorphosis into larvæ. On the other hand, we should have to assume that a repeated influx of larvæ, or what is more probable, of ova, must have taken place twice at the very least, for an interval of a year and a half is said to have elapsed between the first and second passages. I am not in a position to give a satisfactory explanation of the last circumstance.

COCAINE, AND ITS USES IN DENTAL SURGERY.*

By ARTHUR C. GASK.

Mr. President and Gentlemen,—From the earliest dawn of operative surgery, the alleviation of pain during the performance of surgical operations, has engaged the attention of practitioners of the “healing art.” In the works of ancient writers, we find constant allusion to the need of some drug which should numb the senses of the unhappy victim for whose benefit the rude surgery of the times was called into play. Homer sang of this “wine of the gods” which “should lull all pain and bring forgetfulness of every sorrow,” a poet’s dream, the which, alas! for nigh three thousand years was to remain without the regions of reality. And with the absence of any such potion can we wonder that surgery made so little progress until these latter days; it was the discovery of anæsthetics that made the triumphs of surgery possible.

But while ether and chloroform to a great degree satisfied the wants of the general surgeon, among practitioners of the minor branches of surgery the need still existed for some anæsthetic, the which while carrying with it an insensibility of certain parts should not produce a general state of unconsciousness, but should be local in its properties; and when that branch of surgery to which we, gentlemen, have the honour to belong, emerged from out the dens of quackery, and the darkness of pre-dental ages, to take an honoured stand amid the sciences, this need became more and more apparent.

The dental surgeon in pursuit of his calling, is compelled to submit his patient to many painful operations of a comparatively trivial nature, for which the administration of a general anæsthetic would be an absurdity, but which, when undertaken alone, are the occasion of much discomfort and pain, rendering a visit to the dentist’s a thing above all others to be avoided. It was for such cases that a reliable anæsthetic was to be desired, and thus, when in 1884, Professor Köller, of Vienna, demonstrated the practicability of the salts of cocaine as a local anæsthetic in operations on the eye, a hope arose among the dental practitioners that the long desired anæsthetic was at hand; and now, not only would the patient enjoy an immunity from pain, without the many inconveniences of a general anæsthetic, but also, the operator would obtain the intelligent co-operation of the patient.

* A paper read before the Student’s Society of the Dental Hospital of London

A rush was made upon the drug, the cost of which fell in a short time, from three shillings a grain to less than as many pence.

But whilst with many practitioners the injection of cocaine in small doses satisfied all expectations, it soon became apparent that the employment of the drug in any but the very smallest doses was not without its dangers. Some persons it appeared possessed an idiosyncrasy to the drug which could not be determined beforehand, and so guarded against. In *some* patients the drug could be administered in very large quantities without the manifestation of any toxic effects whatsoever—indeed a German surgeon records a rectal injection of 48 grains with every success : in *other* patients, however, the injection of one grain, or even less, brought in its train symptoms of so alarming a nature, that, in one case at all events, artificial respiration had ultimately to be resorted to to restore the patient to a condition of consciousness.

Such disastrous consequences attending the injection of such small doses, had, as can be well imagined, a very sobering effect upon the generality of practitioners. Men began to look askance at a drug capable of producing such mischief, and cocaine fell into bad repute. But whilst many dropped almost all use of the drug, there arose another class of practitioners who stoutly defended its use, maintaining that in small doses, and with proper precautions, cocaine could be safely and advantageously administered. And then commenced a fierce controversy. Countless communications both for and against appeared in various journals. From the journals the warfare was carried to the learned societies, the papers and discussions before which, were the satisfactory means of proving that, upon this subject at all events, no two gentlemen held exactly the same opinion.

And now as the years roll on, we seem as far as ever removed from any reliable estimation of the drug, and notwithstanding its having occupied a prominent position before the profession for over five years,—notwithstanding the long series of careful experiments in the laboratories of competent physiologists, so many and diverse opinions are held that the anxious student setting forth upon his professional career and desiring to obtain certain information concerning the drug, may well pause before the mass of contradictory evidence heaped before him, and echo the old cry of Pilate, “What is Truth?”

On the one hand he will find those, who on account of the

unpleasant toxic effects to which it sometimes gives rise, refrain altogether from its employment, holding that the danger and uncertainty attending its use fully outweigh the advantages of any anæsthetic properties it may possess. On the other hand he will find those who make use of it on every possible occasion, and who employ it, not only for purposes of extraction, and for external application to the mucuous membrane, but who also boldly inject it for the shaping of sensitive cavities, the drilling of retaining points, the extirpation of pulps, and for operations of a like nature. But leaving for one moment what I may call the controversial aspect, to which this paper is mainly devoted, I would briefly consider the properties of cocaine, and the uses to which it may be put in "dental surgery."

Cocaine is an alkaloid obtained from the leaves of the *Erythroxylon Coca*, a native of South America. It is met with in various combinations, but it is in the form of the "hydrochlorate" that I intend to consider it this evening, the other combinations possessing no properties which render them, in any sense, superior to the hydrochlorate. Hydrochlorate of cocaine of the formulæ $C_{17}H_{21}NO_4$, HCl , presents itself to us as a colourless crystalline powder readily soluble in water, alcohol and ether. Dissolved in water it is easily recognised by its peculiar bitter taste, and the subsequent feeling of numbness. It possesses powerful local, anodyne and anæsthetic properties, and is of some slight value as an antiseptic. Its physiological action is not at present fully understood; it is said to raise the temperature, quicken the pulse and render respiration more frequent. When administered internally, the blood pressure first rises and then falls. It is, of course, in its anæsthetic properties that we are chiefly interested. Cocaine is above all things an anæsthetic for the soft tissues, and in operation in the mouth affecting the mucuous membrane, and the immediate subjacent tissues. Its salts prove very efficacious. Its employment by the dental surgeon is restricted to two methods; by local applications of strong solutions and by hypodermic injection. Applied locally, a 10°-20° solution can be employed, but when used hypodermically the strength of the solution should never exceed 10°.

A 20° solution applied to the mucuous membrane, on a piece of cotton wool, will prove of great service in wedging and separating teeth, in forcing the silk up in high conical edges, in removing portions of overhanging gum, in the

treatment of "pyorrhœa alveolaris," in the lancing abscesses, and on many other occasions which will suggest themselves to the operator as occasion requires. Also a few drops on a piece of cotton wool applied to a carious cavity, will enable us to determine the seat of a probable exposure, and when found, to enlarge that exposure, and so permit of the escharotic accomplishing its work of destruction with a minimum amount of discomfort. Then, too, in single rooted teeth, it is very often possible to painlessly extirpate the pulp with external application alone, of course we must first obtain a good exposure. Again, in the treatment of those teeth in which the periosteum is so acutely inflamed as to permit of no manipulation whatever, we shall often find that a 20° solution applied to the gum, will in a few minutes greatly lessen the sensibility of the tooth, and will enable us with little discomfort to our patient to open up the canals and dress them. Lastly in the taking of impressions in the mouth which exhibit such an intolerance to the introduction of all modelling materials, painting the palate with a 5° solution, will in nearly all cases enable us to obtain a good impression, without any production of that retching, so distressing to the patient, and so annoying to the operator. We shall of course find this treatment invaluable when we desire to obtain an impression of the soft palate.

It has been pointed out by some observers, that the employment of a cocaine-spray at the back of the mouth, if continued for some little time, is liable to produce a paralysis of the superior laryngeal nerves, and as permitting of the saliva trickling down with the larynx and producing spasm of the glottis. The objection, which many believe to be more fancied than real, at all events does not apply to any solution that we, as dental surgeons, may use in the fore part of the mouth, seeing that the amount of cocaine employed is so very small, and also by the time it reaches the back of the mouth, it has become so very largely diluted with saliva that its anæsthetic properties are greatly reduced. However, "to make assurance doubly sure," we can when possible employ the "saliva-ejector," and not allow the patient to swallow his saliva.

Bearing in mind its slight antiseptic properties, I have recently employed cocaine for relieving the after-pain of extraction, a $\frac{1}{4}$ grain compressed tabloid placed in the socket, will at all events for some hours, give a complete immunity from discomfort.

I will now pass to a consideration of hypodermic injection. Whilst local application of strong solution to the mucuous membrane are always of great service, it is in the hypodermic injection that we shall see to best advantage the anæsthetic properties of cocaine. Now the successful injection of cocaine for purposes of tooth extraction, presents no little difficulty to the dental surgeon. We are dealing not only with surrounding soft tissues, but have also to overcome the physical barrier presented by the alveolus, and some little judgment is required to bring the operation to a successful issue. We have not merely to inject the solution beneath the mucous membrane, but to so inject it, that it may penetrate the porous bony tissue, and embrace in its anæsthesia, the periosteum and nerves of the offending tooth. In fact, the injection requires as much care, as does the shaping of a cavity we are about to fill with gold. The syringe employed should work easily, and the needle be fine, sharp, and scrupulously clean. The introduction of a small fine needle will obviously occasion much less pain than the introduction of a coarse one. The needle should be rendered thoroughly aseptic previous to each operation, and one of the most certain methods of accomplishing this is to draw up through the needle a few drops of strong carbolic acid. The solution we inject must be perfectly fresh, inasmuch as the salts of cocaine once in solution rapidly decompose, a decomposition which without doubt accounts for many of the failures and unpleasant after symptoms, attending the early injection of the drug. I may here mention that for purposes of external application alone, a solution containing 5° of Saccharina can be very profitably made use of, inasmuch as the introduction of the Saccharina, not only overcome the unpleasant bitter taste, but also permits of the solution resisting decomposition for an indefinite period of time.

Returning to the subject of injection, the salt should be dissolved in water slightly warm, not hot, hot water favours a decomposition in which the anæsthetic properties of the drug disappear. The strength of the solution varies according to individual taste, from 4° to 20° solutions being employed. I myself have employed a 5° solution ($\frac{1}{2}$ grain to 10 minims of water) in some half-hundred cases with, on the whole, very satisfactory results. Previous to injection the gum, in the neighbourhood of the teeth we are about to extract, should be dried, and a napkin folded round to exclude the saliva, in exactly the same method we should employ

were we about to fill the tooth without resorting to the rubber-dam. By this means we can see clearly if our solution remains within the tissue, and does not escape back into the mouth through the puncture. All air must be expelled from the syringe. A few drops of a 20° solution applied to the mucous membrane will render the puncture painless, and indeed, if we discharge one minim of the solution upon the immediate entrance of the needle into the soft tissues, the whole introduction of the needle can be accomplished absolutely without the patient's knowledge. It is generally advisable to inject in three places, and inasmuch as we shall obtain most of our anæsthesia through the outer and thinner wall of the alveolus, two punctures should be made on the labial aspect of the gum, and the remaining one of course on the lingual aspect. The needle should be inserted about $\frac{1}{8}$ of an inch below the free margin of the gum, and driven obliquely, upwards or downwards, as the case may be, in a direction towards the apex of the tooth, until the mouth of the needle impinge directly upon the bony tissue. Great care must be exercised to penetrate through all the soft tissues, otherwise the current of our solution will be misdirected, and we shall obtain an anæsthesia of the superficial soft tissues alone, the peridental membrane and nerves of the tooth remaining uninvolved. The needle once in position, and a finger being placed on either side and pressed forcibly down upon the gum to prevent any rising up of the soft tissues, the solution should be slowly discharged. Some little resistance is often offered to the entrance of the solution, but a steady forcible pressure will generally succeed in driving it home. Almost immediately upon the injection of the cocaine, we shall obtain a complete blanching of the gum in the neighbourhood of the puncture, due without doubt to the contraction of the capillaries. The solution injected, the needle should not be withdrawn for some few seconds, and when withdrawn, a finger should be placed over the puncture to prevent any escape of the solution. The full anæsthetic properties of the cocaine are not obtained for some six or seven minutes; we must therefore allow that time to elapse between the injection and the operation. It is generally advisable to place a few crystals of the salt just round the neck of the tooth to render painless the driving up of the forceps. The most convenient form of the Hydrochlorate of Cocaine for purposes of injection is that of the compressed tabloid—half-grain tabloids can be obtained at all the depots, by the em-

ployment of which we are spared all trouble of weighing. Now the objections urged against the hypodermic administration of cocaine are two-fold.

1st, that it often fails to produce the required anæsthesia, and 2nd, that its injection even in small doses often gives rise to the very alarming symptoms of cocaine poisoning.

With regard to the first objection, the failure of cocaine in all cases to produce anæsthesia, from a series of experiments upon myself, and upon patients in this hospital and elsewhere, I am forced to the conclusion, that the production of a suitable anæsthesia by hypodermic injections of cocaine, almost entirely depends upon the manipulative skill of the operator. In my opinion, the anæsthesia is always present, but not always in the required situation ; and hence will, where no careful investigation is made, escape detection. I am myself one of those unfortunate individuals whose dental organs present an entire laboratory for scientific investigation. I have but few teeth which do not on some surface or other bear evidence of that proficiency to which conservative dentistry has now arrived. At the beginning of the year, I was for some few days beyond the pale of dental mercies, and during that period, a dead upper canine took upon itself to occasion me no little pain. The tooth had been filled with a hard filling, and so I had no means of getting at the canal to insert a dressing. I had with me, however, a hypodermic syringe and some four grains of cocaine, and for the purpose of obtaining some temporary relief, I injected a half-grain from time to time. In the first injection, I altogether failed to obtain any beneficial results whatsoever, the tooth remaining just as sensible to pressure after each injection. But the reason for this continued sensibility of the tooth was not difficult to find, for in each case I obtained an area of complete insensibility elsewhere. On the first occasion I obtained a complete insensibility of an almost entire half of the upper lip, so much so, that I was enabled to drive a needle in to a pretty good depth (a circumstance which, by-the-bye, I afterwards regretted when the effect of the cocaine had worn off) ; in the second injection, the area of insensibility was considerably higher up in the neighbourhood of the nares. In the first injection, I had evidently not driven my needle through all the soft tissues, the current of my solution becoming thereby diverted ; in the second case, I had driven my needle too far up. Now in both these injections, and in the latter one especially, had they not been

made in my own mouth, an area of insensibility would in all probability have escaped notice, and discredit would have fallen upon the drug. The patient's attention would have been naturally concentrated upon the tooth itself, and any other feeling of numbness he might experience would be received as a matter of course. Since that time, in all those cases where I have not been successful in obtaining a full anæsthesia, and I must confess that I have sometimes not been successful, especially in my earlier injections, I have sought for an anæsthesia elsewhere, and have never been disappointed. In lower molars do we especially fail to obtain a satisfactory anæsthetic ; their position in the mouth rendering injection somewhat difficult. In one such case, I obtained a good anæsthesia in part of the floor of the mouth. And so I would urge that in the employment of hypodermic injections of cocaine, for the purpose of obtaining a local anæsthesia, in order to ensure success, much more dependance should be placed upon the method of injection.

With regard to the second objection, that with some the administration of cocaine is often accompanied with bad toxic symptoms, I shall not attempt to gloss over this unfortunate failing of the drug, nor to detract one iota from the importance of placing above all other considerations the safety of our patient, but in face of the small quantity of cocaine required to produce anæsthesia, and considering the vast quantities of the drug annually employed in all branches of surgery, we are surely justified in the employment of half-grain doses, where the toxic effects, if they do arise, are of so feeble and transient a nature that we shall have no difficulty whatsoever in coping with them. Moreover, their occurrence appears to be less frequent where weak injections are employed. Myself, I have never met with toxic effects in 5° solutions. It is, of course, necessary in dealing with all drugs of the dangerous nature of alkaloids, to adopt great caution, but if the physician in the course of his ministrations is to employ only those drugs which can be administered with perfect safety, he must abstain from all use of many drugs of the greatest importance, and bring down his pharmacopœa to very narrow limits. The administration of comparatively small doses of quinine, will in some patients give rise to most distressing symptoms ; in others, half the standard dose of arsenic will produce severe abdominal pain, and the smallest dose of mercury will, in some patients, bring on profuse salivation. Others exhibit a similar intolerance to opium ; and

so we can never be positively certain as to the ultimate consequences of any drug we may administer. If then, we are to condemn cocaine, to be consistent, we must never prescribe quinine.

Let us never administer cocaine to hysterical women : if so, we shall be unable to distinguish between the effects of the drug and the natural consequences following an operation in such patients. Obviously, too, we should not administer to patients known to be the subjects of heart disease ; and on all occasions where we do employ cocaine, let us make it a "golden rule" never to administer more than half a grain upon the first injection.

Cocaine exhibits its bad effects by depressing the action of the heart, and producing giddiness, nausea, flushing of the face, periodical pain and palpitation, paralysation of the lower extremities, syncope, and death. Death has, I believe, occurred only once under administration of cocaine, and on that occasion in Russia, after a rectal injection of 23 grains. To counteract its depressant action on the heart, especially in weakly patients, Mr. Boyd Wallis dissolves the cocaine in absolute ether, being enabled under such conditions to employ a larger dose of the alkaloid without producing any unpleasant after-symptoms. Cocaine in all its forms is freely soluble in ether, and we shall without doubt find this method of solution of great service where we desire to extract several teeth at one sitting.

Should symptoms of cocaine-poisoning manifest themselves, we must treat them in the ordinary manner; place the patient in a recumbent position, and administer a stimulant ; and one of the best and most certain stimulants we can administer is ether. Fifteen minims of ether, either alone, or in conjunction with same amount of aromatic spirit of ammonia, will rapidly restore the patient to a natural condition. Smelling salts can be applied to the nostrils. In bad cases, the inhalation of a few drops of nitrate of amyl may be resorted to. Coffee has been suggested as an antidote, but offers no advantages over ether, and of course requires longer time for its preparation.

And now I must bring my remarks to a close. In cocaine we possess without doubt a valuable therapeutic agent, capable of proving, with intelligent use, an immense boon, both to ourselves and our patients. An ideal drug it is not. It remains then for us to employ it to the extent of its utility, that they who come after us, looking back in the light of

perhaps fuller knowledge, and beholding how we strove to cope with the sufferings of our age, deeming no labour lost in such a cause, shall learn in the history of the alkaloid cocaine, how when the first glamour heralding its birth into the world had passed away, and its shortcomings became apparent to all, it was not cast as a broken idol, upon the highway of knowledge, but faulty and imperfect though it was, became in the hands of those trained to careful and accurate observation, a means of lessening the anguish of the torments of a cruel Nature, and of detracting from the sum of human pain.

ARTIFICIAL TEETH REMOVED FROM A MAN'S STOMACH.

LORENZO HINCKLEY, of Madrid, a small town in the interior of Maine, while asleep, swallowed his artificial teeth. Local physicians were unable to relieve him, and on Monday he came to the Portland General Hospital. In the meantime he had suffered terribly, being unable to swallow anything.

On Tuesday, Dr. Louis W. Pendleton, the hospital surgeon, performed a preliminary operation, cutting open the abdomen, exposing the stomach, and sewing the organ to the flesh about the incision by fifteen stitches. He then allowed the patient to remain for three days, until the stomach had adhered firmly to the tissue. This was done to prevent coughing or forcing out the gastric juice and cause peritonitis.

To-day he completed his operation. An incision was made into the stomach large enough to admit three fingers, and the teeth were found to be lodged in the œsophagus, three inches from the stomach and beyond reach. Dr. Pendleton had prepared for this emergency a long piece of whalebone perforated at one end. Through this perforation, which was like the eye of a needle, a thread was passed attached to a sponge. This instrument was passed from the mouth down through the œsophagus, and pulled out of the incision in the stomach, the sponge taking the teeth before it into the stomach, whence they were easily removed. The edges of the plate to which the teeth were attached were serrated, and the muscles of the œsophagus had contracted about it, holding it firmly.

Mr. Hinckley is quite comfortable to-night, with the chances in favour of his recovery. The operation was a very novel one, and is attracting attention, both among the medical fraternity and the general public.—*Items of Interest.*

British Journal of Dental Science.

LONDON, JULY 15th, 1890.

THE RESULTS OF THE DENTAL EXAMINATIONS DURING 1889.

THE volume of "Minutes of the General Medical Council" for the first half of the current year, contains, among others, an interesting table showing Results of Professional Examinations held in 1889, for Qualifications granted under the Dentists' Act. It enumerates six licensing bodies. The College of Surgeons of England, of Edinburgh, and of Ireland. The Faculty of Physicians and Surgeons of Glasgow and the Universities of Harvard and Michigan. The Diploma granted is in the case of all the British licensing bodies, a License in Dental Surgery. That of Harvard is a D.D.M., and of Michigan a D.D.S. All the Examinations are Written, Oral, and Practical, except that Harvard has no Oral portion, and Edinburgh no Practical. We cannot but think that these omissions are very much to be deprecated. Although a written examination has many advantages, yet an oral exam. is, in the hands of a competent examiner a far more potent weapon for finding out candidates' merits and demerits. As regards the absence of a practical examination we can only say it is absolutely inexcusable. To call any examination, which omits this practical part, a test as to a man's fitness to practise Dental Surgery, which is above all

things practical, is, in our opinion, little short of an absurdity
The results are as follows :—

	No. of Candidates	No. who passed	No. rejected	Per centage of failures to Cands.
England	- 47	31	16	34.0
Edinburgh	- 33	29	4	12.1
Glasgow	- 33	23	10	30.3
Harvard	- 25	17	8	32.0
Michigan	- 36	32	4	11.1
Totals	<u>174</u>	<u>132</u>	<u>42</u>	average <u>24.1</u> p.c.

For some unexplained reason the results of the Irish College are not given. One is struck at once by the difference in the per centage of rejections. Taking the average per centage of rejections, for all the examinations as 24.1. A glance shows that Edinburgh and Michigan are very much below this. We will leave the question of Michigan, since the examination there is conducted under somewhat different conditions, the teaching and examining bodies being one and the same. There are, of course, two explanations of a low per centage of failures. One, a high standard of proficiency in the candidate, the other a low standard of examination. We cannot, of course, say which is the correct explanation in the case of Edinburgh. But candidates are usually much of a muchness all the world over, and the absence of a practical test at this examination does not, as we have already said, coincide with our ideas as to what ought to be, and is, to say the least of it, suggestive. We do not mean to say that the sole aim and object of an examiner is to find out what a candidate does not know, and then to refer him; on the contrary, we believe the duty of an examiner is to find out what a candidate does know, and to pass him. We know many examiners do not regard their duty as such, having found a point a man may know nothing about, they keep at it until the "time bell" rings. We would have it impressed on all examiners that their duty is to find out if a man is sufficiently qualified to serve the public honorably and well as a practi-

tioner; how, however, they can ever do so without a practical examination, is a mystery that no one will, we take it, be able to solve.

THE Educational sub-committee of the Dental Board of Victoria proposed the following list of books as text-books for the modified examination :—

1. Mechanical Dentistry—Richardson, latest edition.
2. (a) Dental elementary anatomy and physiology—C. S. Tome's Dental Anatomy and Physiology, latest edition, first five chapters.
- (b) Dental elementary surgery and pathology—Colman's Dental Surgery.
3. (a) General elementary anatomy and physiology—"Human Physiology"—Henry Power. "Surgical Applied Anatomy"—Frederick Treves.
- (b) General elementary surgery and pathology, "Surgical Pathology"—A. J. Pepper.

The Dental books were adopted, but the Committee were respectfully requested to supply further information with regard to the others. This strikes us as being just as well. A more curious collection could not be imagined. For though both the "Surgical Applied Anatomy" and the "Surgical Pathology" are such excellent books, we should never in our wildest moments have thought it was possible to learn elementary anatomy and surgery from them.

THE scheme for erecting the Dental Hospital in Melbourne appears now to be fairly under way. It is estimated that the initial expenses of the hospital for the first year will be £250, and afterwards an annual expense of £175. Mr. J. J. Blitz has offered an annual scholarship of ten guineas to be called the "Blitz scholarship," but he wishes to reserve power to increase or discontinue it at his pleasure. We do not suppose any would grumble if he increased it, but we are not altogether in favour of a scholarship of this kind, which to-day is, but to-morrow is not. A scholarship is only of real value when it has won an acknowledged position; this is a work of

some years, and it is at least doubtful whether the "pleasure" of presenting it will have endured so long.

A judge in Wisconsin has decided that a dentist has no legal right to pull out a tooth on Sunday. We suppose he meant that a dentist has no legal claim to any remuneration for work done on a Sunday. There can hardly be any legal distinction between a medical man's visit and a dental operation, both being called for urgently to ease a fellow man's suffering. One hardly knows who to pity most, the despicable creature, who, having disturbed the Dentist's well-earned day of rest, to be freed from pain, then refuses to pay the fee ; or the law which aids and abets him.

The police of Chicago have discovered that smoking opium has been extensively smuggled in lemons. The lemons are opened near one end, the pulp removed, and the opium packed in, after which the opening is skilfully closed with cement and the traces of the seam obliterated with some compound of the same colour as the rind. It is thought that large quantities of opium are are smuggled into the States in this manner.

THE *Medical and Surgical Bulletin* is responsible for the following :—" Late in the evening a doctor received a note from a couple of fellow-practitioners, saying : ' Pray step across to the club ; we are one short for a rubber.' ' Emily, dear,' he then said to his wife, ' I am called away again. It appears to be a very serious case, for there are two doctors already in attendance.' "

THE Annual Conversazione and Prize Distribution of the Dental Hospital of London will be held on Wednesday, July 23rd, at the Stanley Exhibition. It seems quite fit and proper that the Dentals should have some share in the Stanley craze, if only by going to the Exhibition. We are

exceedingly glad to note that Mr. Thomas Underwood will distribute the prizes. The appearance of one of our fathers in dentistry upon the platform will be very welcome.

WE would draw special attention to Mr. Birch's letter printed in this issue. It will there be seen that substantial reductions in fares to Berlin will be granted by the Great Eastern Railway if parties of not less than thirty travel together. We are officially informed that they have obtained the necessary concessions from the German Railways enabling them to carry out these reductions. Return fares, first-class will be reduced to £4 17 0, second-class, £3 7 0.

THE expense connected with collections for charitable purposes is always a sore point with supporters of public institutions. Those of Birmingham, however, can hardly complain at the cost of the Hospital Saturday Fund, for the present year, £9,859 were collected, the expenses amounting to £404 or 4 per cent. London is by no means so economically served, the expenses amounting to 22 per cent. of the sum collected. It is worthy of note that the amount of the Birmingham collection exceeded those of Manchester, Liverpool, Sheffield and Bradford combined.

A CURIOUS case of a tooth in the nasal cavity has been shown at a clinic at the Königlichen Zahnärztlichen Institute. The patient was born with a hare-lip, which was, however, operated on by Dr. Mittenzweig. During the last three years a well-formed tooth has developed in the *right ala nasi*. It grows from above, downwards, and apparently comes in contact with the floor of the nasal cavity.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

ASH'S DISCS FOR ENGINE MANDRILLS.

MESSRS. ASH & SONS send us some Rubber Discs, which they introduced to the profession some years ago, to overcome the passage of grit into the handpiece of the engine. This matter has recently been brought before the Manchester Odontological Society by Mr. G. Whittaker, who showed some long shank mandrills specially designed to meet this difficulty. Probably the discs would be more effective, though on the other hand, the long shank does away with the need for two appliances. The discs are very inexpensive.

SHARPENING DISCS.

The same manufacturer sends us a simple arrangement for sharpening instruments and so forth. We may say, at once, that it is nothing more than a very large emery disc, stiffened and supported by a nickel plated metal disc. These are fixed on any ordinary mandril and worked in the engine. We were ourselves surprised at the rate it will grind down an instrument. By using grades of various fineness a very keen edge can be got. An advantage over the ordinary hone is the entire absence of grease.

Abstracts of British & Foreign Journals.

DENTAL COSMOS.

THE VALUE OF INTENSE COLD IN DENTISTRY, AND ITS PRODUCTION BY THE CHLORIDE OF METHYL SPRAY.

By Dr. N. L. RHEIN.

The use of *intense* cold for producing local anæsthesia was first called to public notice by Dr. B. W. Richardson in 1866. To him belongs the credit of introducing the spray of sulphuric ether. This was supplemented by Dr. Henry J. Bigelow's use of the rhigolene spray. Both of these agents were used in dental practice quite extensively at that time, in the extraction of teeth. The gums were frozen, and the teeth removed with more or less local anæsthesia. It appears that the ether produced the most satisfactory and uniform results.

As a substitute for both of these agents, Mr. Jas. Arnott, of London, introduced bags of an ordinary freezing mixture of pulverized ice and salt.

With the advent of nitrous oxide their use grew gradually less, until now the practice has almost entirely ceased. Of all the men who were producing local anæsthesia in this manner for extracting, only two thought of extending its usefulness toward helping to preserve the natural teeth. If there were any others, they seemed to have refrained from imparting their information to the profession at large.

Dr. J. R. Finney, wrote in the *Dental Cosmos* for December, 1866 :

"I have been experimenting with the narcotic spray-producing apparatus upon sensitive teeth, and find that I can successfully clean and fill those teeth that have heretofore given so much pain to the patient and trouble to the operator." This was corroborated by Dr. J. H. McQuillen, the editor.

It is evident that Dr. Finney wrote to Dr. McQuillen on this subject, and that Dr. McQuillen tried it in his practice, and finding it successful endorsed it.

That this never attracted much attention is evident, since

nothing more on the subject appears in our literature for more than twenty years. This early mention of the spray in this connection was only accidentally made known to Dr. Ottolengui by Dr. F. T. Van Woert, who was turning the pages of the old numbers of the *Cosmos* when Dr. Ottolengui was, as he thought, for the first time introducing the ether spray as an anesthetic for sensitive dentine.

Dr. R. Ottolengui is entitled to the credit of introducing the use of ether spray for the purpose under consideration; for the idea was not only original with him, but by persistent clinics and a number of articles written for the journals the profession was compelled to take notice of his views.

Having witnessed Dr. Ottolengui's clinical demonstrations I gave it numerous trials. It will almost invariably produce the result, but has numerous disadvantages, such as length of time required to attain the desired effect, and the consequent saturation of everything and everybody with the disagreeable odour of the ether. So much is required that it is difficult to limit its action upon the part to be operated on, and not by any means the least important objection is the inhalation of a very considerable amount of ether by the patient.

In the endeavour to overcome these difficulties it was noted that all of the volatile liquids would produce a degree of cold, the intensity of which was in exact ratio to the rapidity of volatilization. Carbonic acid gas and nitrous oxide are superior to ether or rhigolene, and chloride of methyl is superior to these because it abstracts the heat more rapidly on account of the greater difficulty of keeping it in a liquid form.

Chloride of methyl was discovered in 1834, and while at that time its production was complicated and expensive, it is now manufactured cheaply in Paris from the remnants of beets after the sugar has been extracted. For a more complete résumé of this agent and its usefulness, see *Dental Review* for September, 1889, and *British Journal of Dental Science*, for the following month.

Having used the chloride of methyl for over one year and in over three hundred cases, I speak with the confidence that the long use of one article or method will alone assure. Later observations have only strengthened and confirmed my views as heretofore published. Not a single case of death of the pulp has resulted. In a small percentage of the cases, where the cavity extended near the pulp, there has been a certain amount of subsequent irritation, which has invariably

passed away within a few days. This irritation is almost invariably met with in such teeth whether the methyl be used or not. Still, it is in these cases of close proximity to the pulp that it should not be used unless absolutely necessary, and then with great caution. This is the only class of teeth in which any bad result is to be feared ; nevertheless, while using it frequently in such cases, I have no dead pulps to report. Its beneficial effect is met in excavating between the enamel and dentine. These acutely sensitive places can be prepared, the patient not feeling the slightest touch of the instrument.

In youthful patients the methyl should be used with great caution ; while with more elderly parties much less care is required. In fact, the greater the density of the tooth-structure, with so much more impunity can the methyl be used.

The chloride of methyl was employed in the removal of twenty-one living pulps. In eleven without any pain ; in five there was some slight sensation toward the close of the operation ; in three only a partial anæsthetic effect was produced, and in two (among the very first) it seemed to be entirely effectual. I believe that the methyl was not well applied to these two cases ; they were posterior teeth, and difficult of access with the means then at my command. It was invariably successful in the anterior teeth, and less so the more posteriorly. In old people it worked like a charm.

The methyl having been once applied to the pulp, it should be reapplied as soon as the faintest sensation is apparent. So the operation can be prolonged. If at the first twist of the broach the entire pulp has come away, the operation is invariably a success. When, however, the pulp is lacerated and considerable hæmorrhage ensues, the application of the spray causes the larger end of the canal to become packed with ice, and this is a serious obstacle to the passage of the broach.

In the treatment of neuralgia the methyl is invaluable. It will almost invariably bring about an immediate relief from pain, if not an absolute cure. Attention is especially called to its wonderful efficacy in relieving the various headaches resulting from peripheral irritation around some portion of a tooth, be it an exposed pulp, pericementitis, an alveolar abscess, or the result of some medicinal irritant.

It is a wide-world cry against the dentists that they torture their patients. Those of strong physique submit and endure the agony entailed in dental operations. With a second class

this is simply an impossibility, and thousands of teeth are neglected and lost from this cause, even though the patients may be able to pay for our most skilful services. Then there is a third class of patients : those who after months of torture in anticipation finally come into our hands, and with nerves strung to a hurtful point pass through the ordeal and have their teeth saved, but at what a cost ! We do not sufficiently consider the consequences of shock in the dental chair. Yet undoubtedly many suffer for months and even years from injuries to the nervous system received whilst in our hands.

The greatest duty of our profession to-day is to discover and adopt a mode of painlessly performing our operations. You owe it to yourselves, to your profession, and to your patients, to investigate and to adopt whatever is beneficial.

IMMEDIATE ROOT-FILLING.*

By EDMUND NOYES, D.D.S., Chicago, Ill.

The necessity for making a root-filling implies disease, either in the pulp or in the tissues surrounding the apex of the root, and the variations in the character and severity of the diseases to which these parts are subject is very great. The filling of the root may follow the cure of the disease, or may anticipate it, being done with the expectation that a cure will surely follow the operation.

To claim that so wide a range of pathological conditions as we find in connection with teeth having dead or diseased pulps can invariably be treated and cured at one sitting, so as to make immediate root-filling proper in all cases, is quackish in appearance and false in fact. It is certainly true that a considerable number of cases will admit the removal of the pulp and the cleansing and filling of the roots at one sitting with a fair degree of safety, and many others will succeed under such treatment that cannot certainly be predicted to do so beforehand.

To attempt, very briefly, to indicate some of the limitations.

* Read before the Chicago Dental Society, June 3, 1890.

and contra-indications to the practice of immediate root-filling, will be the purpose of this paper, taking first the cases in which the practice is safest ; those in which the pulps have been devitalized by the dentist or extirpated without previous treatment, and the pulp chambers and canals preserved absolutely from septic influences. In a large proportion of these there is but little objection to filling roots at once, and in some the objection may be no more important than relates to the length of the sitting required for the complete cleansing, drying and filling of perhaps three roots, one or two of which may have proved very troublesome and difficult of access. In other cases the sensitiveness and pain attending the removal of the filaments of pulp toward the end of root-canals, especially very small ones, will be such as to compel the postponement to another sitting.

I will quote, in this connection, from a letter that I have received from Dr. Black :

"I would suggest that mere emphasis is due to *time* in the matter of thorough root-cleaning. It often happens that root-canals, which I thought very well cleaned, disclose considerable debris upon cotton which has laid in them for a week. Indeed, I have come to feel that I can get a root-canal *clean* with much less expenditure of time and worry, both to myself and patient, at two sittings a week or so apart, than at one sitting. A few cotton fibers placed closely in a canal have a marked tendency to change their position, straightening here and there and forming easier curves, or forming sharper angles at some points and easier curves at others. In this way debris or remains of dead pulp tissue become ensnared in the meshes of the cotton and are brought away with it. Furthermore, shreds of pulp near the apex of the canal are loosened by the absorptive process from the living tissues and easily come away after a week, though much teasing would have been required at the first sitting. I am very decidedly of the opinion that these matters are important in those cases in which the pulp has not come out clean and whole at a single sweep of the broach, and, unfortunately, this does not occur so frequently with me as I could wish."

"I am afraid that time will show a larger proportion of abscesses after immediate root-filling than follow the more conservative method."

In other instances in which the pulps have been successfully removed to the apices, the pain attending the carrying of the filling material to the ends of the canals will be found

so much greater at that time than at a subsequent sitting, as to make it worth while to postpone the operation. If we were content to stop at the first intimation of pain or sensation by the patient, this objection could of course be easily overcome, but that would mean in many instances, leaving one-third or one-half the canal nearest the apex unfilled. In other instances, a considerable number, there will be, after removal of the pulp, such persistent bleeding or exudation of serum into the canal as to make cleansing and drying difficult or impossible. This is a more serious objection against completing the operation, and unless it can be overcome, should contra-indicate. These considerations and others like them serve, in the case of the writer, to postpone the root-filling to a sitting subsequent to the one at which the pulp is removed, in three-fourths or more of the cases in which a living pulp has been destroyed. It is possible, however, that in the case of some practitioners these proportions may be reversed, with as good results as they could obtain in any other way, and the general statement may be made that whenever pulps have been devitalized and proper care taken to prevent sepsis, or, more generally stated, in all cases in which the root canals and the apical space are certainly known to be, at the time and previously, in an aseptic condition, the presumption is in favour of immediate filling, subject to such contra-indications as may be developed in any particular case.

The presumption runs strongly the other way in all of the very numerous cases in which the pulps are found dead when first presented for treatment, with the pulp chambers open to the ingress of the fluids of the mount, and in most of these in which it is not found open.

The fundamental requirements for the treatment of all such cases are the removal and cleansing from the canals of all debris and decomposing material, the evacuation of pus, if any be present, and the exhibition of disinfectants or antiseptics till all pathogenic organisms have been destroyed. Those who advocate immediate root filling in almost all cases do so upon the assumption that this can be certainly accomplished at one sitting.

Theoretically, such results can hardly be expected, and clinically we find numerous exceptions to its practicability. What is equally important in relation to this practice, it is hardly ever possible to be absolutely sure that it has been accomplished except by a trial, observing the behaviour of the tooth subsequently to the treatment, and inspecting it after the

lapse of some time. In other words, although a large proportion of the cases now under consideration can be cured by one treatment and would succeed perfectly if immediately filled, it cannot be certainly known beforehand which will do so. It may be convenient to make three classes, and say something of each separately. First those having suppurating, dead or putrid pulps, but with little or no periodontal inflammation, and no abscess or infection beyond the apex of the root, the disease being confined within the canals of the tooth. The second class those having blind abscesses, either incipient or established, and third those having fistulous abscesses, and both the latter either with or without some territory of carious or necrosed bone in connection with the abscesses.

The first and second of these classes cannot always be readily distinguished, and it is often very unwise to be too curious on that point at the first sitting, since the contents of a foul root canal, if pushed through the foramen, even in minute quantity, are often admirably well calculated to start an abscess where none existed, or waken to acute activity a chronic one that may be quiescent. If the entrance of the delicate nerve bristle into the canal causes pain, some vitality of that portion of pulp toward the apex may be suspected, and if blood flows which can be certainly determined not to come from beyond the foramen, vitality in that portion of pulp may be safely assumed, and we may proceed with that canal as if we had just extirpated the whole pulp, only using more care to disinfect everything thoroughly, but "there is so much liability of failure to disinfect them perfectly, or of pushing poisonous material through the apex that I am afraid of them."* Sensation in a canal without any show of blood is not so decisive, for the tissues at the apical space are sometimes very sensitive and respond even to the presence of a broach pushed forward in a fine canal.

In most instances it is far safer to confine the cleansing at the first sitting to the pulp chamber and the larger portion of the canals, using instruments much smaller than their calibre so as certainly to avoid any piston-like action, and close them tightly or nearly so, with an abundant quantity of some diffusible and non coagulating antiseptic. At the next sitting, after a few days, thorough cleansing of the canals can be completed with safety; but the root-filling should wait the result of another probation, this time of about a week, and if

* Black.

repetitions of treatment are necessary, they should not be made too often, for antiseptics and disinfectants are usually irritating, and it is often necessary to discriminate between the soreness of an incipient abscess and that caused by the medicines used.

The cases of blind abscess are frequently claimed as fit subjects for immediate filling, and in the judgment of the writer, can never be safely or wisely treated in that way unless it is desired to compel or make a fistulous or lancet opening into the abscess, and even then it is almost always best to postpone the filling. It is manifestly much more difficult to cleanse or disinfect a blind abscess through the apical foramen which is often small, than it is if the liquid pushed through the foramen can move through the foramen can move forward freely to find exit through a fistula. The enlargement of foramina with a drill will almost always prove injurious, and will cause the loss of more teeth than it will increase the chances of saving. The attempt to force fluids or medicines of any kind through an ordinary apical foramen so as to cleanse and disinfect a blind abscess sufficiently to be sure of immediate filling with safety, will usually prove futile, and often the only result attainable will be a change from chronic quiescence to acute activity. The best treatment for such cases is by the slow diffusion of some antiseptic, non-coagulant liquid placed in the pulp-chamber and root-canals, and the action of the volatile camphors formed from it; but this takes time, and often a long time, and makes the filling remote instead of immediate.

The last class to be considered are those having fistulas. In respect to these it is often said that if the proper medicine can be forced through the tooth till it appears upon the gum at the mouth of the fistula, they will always get well and may as well be filled at once as at any other time; but who will dare to claim that every such case *will* get well after one treatment, or that they are any more likely to with the root permanently filled then if properly cared for by a temporary filling?

The question of immediate filling will turn then, mainly, on the question as to the usefulness or otherwise of the root canals as a means of access to the abscess for purposes of treatment. We have already referred to the difficulty of cleansing a blind abscess because it has but one opening into it. If we fill the roots of a tooth having a fistulous abscess we reduce it to the same condition, only as the fistula may be a larger and more

manageable opening than the apical foramen. It is true there are some cases in which the passage through the foramen is so difficult as to be practically useless, and these may as well be filled as soon as the root canals themselves can be got into proper condition for it, but in the largest number of cases the canals will be found a useful channel through which to reach the abscess even though they be so small that we must depend upon the slow diffusion already spoken of.

It must be remembered that the foramen is generally, though not always, the road through which the cause of the disease first found its way, and is the centre around which it developed, and it would seem a natural inference that it should be the most suitable point of distribution for the medicines which are to cure it.

The fact that a reliable disinfectant or antiseptic has been forced through the root of a tooth till it appears at the opening of the fistula is by no means certain evidence that it has been diffused throughout the abscess so as to cleanse and disinfect every part of it. Abscesses are sometimes large, and sometimes of irregular form, and nooks and corners of them may easily escape the action of the medicine, so that suppuration is not entirely stopped and very soon becomes completely reestablished. Again, a large abscess, even though completely cleansed so as to stop the formation of pus for a time, may become reinfected before it has time to be filled up with new tissue.

If there is much necrosis in connection with the abscess, the difficulty of complete disinfectant at one sitting is greatly increased, and is, in fact, impossible. If necrosis is pronounced or considerable, the best treatment in most cases is probably by its surgical removal, but if not too extensive it appears probable that the persistent contact with some quiet diffusible antiseptic may control its irritant effect upon the adjacent living tissues to such an extent that it may be gradually absorbed and replaced by sound material. The question of immediate filling of the roots is often less important in such cases, since there is likely to be freer access through the fistulus.

It seems to the writer that consideration such as these, which have been briefly mentioned, are quite sufficient to confine the practice of immediate root-filling within very narrow limits.

DENTAL REVIEW,

REPAIRING BROKEN BRIDGE-WORK.

DR. WM. MITCHELL writes to the *Dental Review* :—Supposing that the backing and flushing is of a substantial nature, cut off any projecting pins that may be remaining, then with a suitable corundum point in the dental engine, grind off remainder of pins and sufficient of the backing to remove any convexity of surface that might remain at that point ; this is to allow the new tooth to fit close to the backing, and to remove any strain, as it is always the greatest just there.

Select a suitable tooth, which must be one of Ash & Sons' as American teeth do not possess the requisite length of pins, besides possessing the disadvantage in this case of having said pins alloyed with iridium, which would render them much too stiff to work well. Find where the pins are to penetrate the backing, drill the holes with a spear-pointed drill, lubricated with glycerine or vaseline. This will simplify this otherwise tedious process. Let the tooth down, then nicely with a fine fissure bur, lubricated as before described, cut two grooves laterally, on the palatal side of the backing, just beyond the pinholes, extending beyond these vertically, and then with the right angle carrying an inverted cone bur of a suitable size, remove sufficient of the backing between the lateral grooves to form as it were a small dove-tailed box. Replace the tooth, then with a suitable instrument, (I use a pair of curved excising forceps) bend the pins together, the ends passing each other, drawing them firmly against the bottom of the recess, pack with soft, quick-setting amalgam, and polish when set. In some cases a small amount of oxyphosphate between the tooth and backing will be found an advantage.

A RAPID METHOD OF REGULATING TEETH.

Dr. J. B. Morrison writes to the *Dental Review* :—A tooth or teeth can be changed from one part of the mouth to another with as much ease to patient and operator, and with as much

promise of a rapid appropriation of and union with its surroundings, as a plant is taken from one part of a flower-bed to another.

The only point necessary to fully understand this method is to ask the question : What prevents us moving a tooth which is out of position, to the position it should occupy?

The answer is easy : That portion of bone, etc., between the two positions. Then why not remove this obstruction—bone, gum and all—from in front of the tooth, move the tooth with its surrounding socket and gum margin, to the position desired, and put the part removed from in front of the tooth in the place from which the tooth was moved. Then all nature has to do is to unite the clean-cut surfaces of bone, periosteum and gum. It is not always necessary to use the section removed, as a thin plate of bone can be made to follow the tooth, or there may be too much room and the arch must be contracted by taking out a section.

In cases where the apex is the pivot upon which the tooth is inclined or rotated the pulp will not be disturbed, but where the tooth with its socket must be taken up and placed in another part of the arch the nerve supply is broken, and unless it is placed in contact with other nerve supply, the pulp must be removed in the usual way, either before it is re-set in its new position, or after the union of bone and gum has taken place. As there is little or no laceration of tissue, this union will take place almost immediately. A simple band to the tooth or teeth on either side, kept in position for a few days, is usually all that is necessary to insure its retention in proper position till a natural and perfect union takes place.

The same method can be applied to several teeth which are to be moved separately or altogether. If they all have to move together in the same direction, they may be cut loose in one section without cutting between the teeth.

An anæsthetic should always be given with properly-constructed instruments, as there is no laceration of tissue and nothing to be thrown off or absorbed by inflammation, the operation and subsequent restoration to health is in most cases far less difficult than an ordinary case of extraction, which tears the tooth from the socket and leaves almost the worst possible condition for speedy return to the healthy condition.

Dr. Morrison uses an instrument made from a Gillot pen. The edge is sharpened (not the pen end) and a clean cut is made down through the gum and alveolar socket. This is then

removed aseptically, and the tooth forced into position and the incised piece of bone and adherent gum slipped into place behind or forward of the tooth operated upon.

UNITING PORCELAIN TO AMALGAM.

By Dr. C. H. LAND, OF Detroit, Mich.

As an auxillary to the process of moulding sections of porcelain, so that they may be made to conform to the exact shape of the cavity in a decayed tooth by means of a metallic matrix, it has, also, come to my lot, to discover and perfect a method of causing amalgam to adhere to porcelain, or any other virtified substance, demonstrating a wonderful degree of tenacity ; and, most important, provides a means of establishing both fillings, inlays, and porcelain crowns with a cement that is absolutely impervious to the action of the fluids of the mouth. By actual tests, the adhesion will sustain a weight of over two hundred pounds to the square inch of surface covered in practice. I have molar crowns composing simply the cusps, the proximal side has a biscuited or porous surface fused thereto. This surface is then saturated with a solution of gold, and, when completed, forms a tooth section, provided with a coating of pure gold, adhering firmly to the porcelain. To this gold coating, amalgam will become thoroughly and firmly attached. In many instances, the roots of molar teeth may first be built up with amalgam and allowed to harden ; it is then trimmed to a convenient shape, a suitable gold lined crown selected, and amalgam burnished to the gold surface ; also, amalgam is burnished over the prepared root, and the two carefully malleted together ; a quick setting cement is then placed between the crown and the adjacent teeth. This holds the cap in place, until the amalgam becomes hardened, when it can be removed, and all rough surfaces polished. By the aid of this new discovery, a great variety of new and useful operations are made possible.

Large cavities in molar teeth may have porcelain stoppers amalgamated in place. Eighth, quarter, half, three-quarters, and entire crowns may be cemented to defective teeth with a substance, that years of experience have shown is absolutely free from being destroyed by the secretions of the mouth.

THINKING ON YOUR LEGS.

FROM some little personal experience in editing remarks of speakers and the reading of transaction of societies, we are convinced that more dentists should be readers of good books—especially books on speech-making and logic. Too few of our speakers in dental societies cultivate the art of speech-making to the point under discussion. Too little preparation is made beforehand when papers are to be read, and too little thought is given to elegance of diction (both in writing and speaking.) Wandering from the subject to relate cases in practice is not complimentary to the author of a paper, or the intelligence of the audience.

As the season of annual conventions is upon us, we beg of the speakers who are to open discussions, and those who are burning to speak, to go prepared and do justice to the subject under discussion. Think of what you are going to say, and if you have a defective memory put down the headings and refresh your memory from time to time. It is in very bad taste to interrupt a speaker, as in many cases it throws him off the track, and an otherwise good speech may be spoiled. Think on your legs.—*Dental Review*.

MODELLING COMPOUND.

J.—, writes in the *Dominion Dental Journal*:—A friend who visited me lately, and to whom I gave some of my home-made modelling composition, suggested to me to send you some samples, and hinted that the profession in Canada would like the recipe. I may say, that while I use plaster of Paris a great deal, I find many occasions to use modelling compounds, and that for pattern plates and temporary fitting of plates, I use it exclusively. The composition is as follows—but I must frankly say that it is not my own, but that I received it from a generous confrère in England some years ago :

French chalk.....	14 parts.
Gum kowie	8 „
Stearine.....	4 „

Melt the latter first ; add the second ; then the chalk, not too much at a time. Stir it constantly. Colour with carmine, and pour it into saucers in thin cakes.

PILOCARPIN IN DRYNESS OF THE TONGUE.

DR. J. G. BLACKMAN writes to the *British Medical* ; Extreme dryness of the tongue is, under any circumstances, a very distressing symptom, and one which does not readily yield to treatment whilst the concomitant cause remains in operation. The sucking of ice or sipping of bland fluids gives but temporary and inadequate relief, and the same may be said of glycerine employed as a paint. In this condition I have successfully used pilocarpin, gr. $\frac{1}{20}$ to gr. $\frac{1}{10}$, in the form of a gelatine lamel allowed to dissolve on the tongue previously moistened with a sip of water. I find this small dose quickly establishes a moderate flow of saliva which persists for at least twenty-four hours, and is unaccompanied by excessive perspiration. The altered state of the mouth is often described by the patient as being delightful. I send this note with the hope that others may share the satisfaction I have experienced, if they have not already done so, in this use of pilocarpin. It is scarcely necessary to add that we must exercise due caution in the use of so potent a remedy.

ANTISEPTIC SYRINGING.

ARTHUR NEVE, F.R.C.S. ED. writes, in the *Lancet* on Antiseptic Syringing,—Syringing is frequently employed to diminish the septicity of a suppurating cavity or sinus. To obtain the full action of an antiseptic, it is desired to bring it into contact with every part of the wall. Hyper-distension has been frequently recommended as the only way of accomplishing this purpose. It is, indeed, a difficult task to syringe effectually a tortuous sinus with numerous pockets and branches. Yet we ought to beware of hyper-distension. At comparatively low pressure fluid will dissect its way along the plane of muscles or under aponeuroses. In this way less pressure than is needed to reach the furthest ramifications of a sinus may open up fresh areas of healthy tissue. By careless syringing I have seen the extent of a sinus much enlarged. Above all is it likely to do damage among the recent adhesions of an operation wound. In short, if there is not provision for the fluid to escape freely at the moment of syringing, the surgeon must bear in mind the capacity of the cavity or sinus ; and remember that if this is exceeded the whole force will practically be exerted against the weakest part of the wall, and that suppuration will follow along the new track opened up by forcible syringing.

Reports of Societies.

STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

ORDINARY GENERAL MEETING held May 19th, 1890, at 8 p.m. Mr. Leonard Matheson, President, in the Chair.

The minutes of the previous meeting were read and confirmed.

Mr. G. Dalton signed the Obligation Book, and was formally admitted to the membership of the Society.

Messrs. Curtis, Richard and Taylor were ballotted for and elected members of the Society. The following gentlemen were proposed for membership.

Messrs. L. G. Austen, R. Bulgin, C. Bullin, T. Clarence, B. Castallotte, G. Hayward, R. Herxhell, C. Hill, E. Miller, G. Price, C. Reed, F. Trott, F. Watson, A. Wilson, and E. Haward.

Mr. F. J. Colyer gave notice that at the next meeting he would bring forward a motion, to alter Rule XVI, making all students of the Hospital members of the Society, the Council reserving to itself the right of referring any name to a ballot at a General Meeting.

On Casual Communications being called for,

Mr. GASK stated that recently he had a lower molar extracted, and having great pain in the socket, he explored this latter under cocaine, and found a piece of amalgam. This must have fallen out of a cavity in the tooth extracted.

Mr. COLYER mentioned a case where similar pain was due to a cusp of a tooth which had split off.

Mr. MOON presented an upper model of a patient, aged 15. One canine and the opposite lateral were missing from the series. The members of the patient's family had the normal number of teeth.

Mr. F. J. COLYER exhibited a clamp similar in form to "Palmer's" but carrying broader phlanges. It held the rubber away from the tooth better than the ordinary form of Palmer Clamp.

Mr. MATHESON showed an excellent model, the impression for which had been taken in gutta percha.

Mr. RILOT made some remarks on the use of arsenic for devitalizing pulps, pointing out the great harm that occasionally occurred from leaving the drug in the tooth too long. He insisted that it should not be left in longer than 48 hours, excepting under most exceptional circumstances, and even then in diminished quantity.

Mr. COYSH said he had a case of necrosis, due to leakage of arsenic on the gum. This he had treated in the phenomenally short space of a week.

In answer to questions asked,

Mr. RILOT said that he should treat a case of arsenic necrosis first with chloride of zinc to slough away the affected parts, and then with Aromatic Sulphuric Acid to stimulate the healing process. He himself generally used gutta percha to seal in the drug, but thought that a mastic dressing well put in was perfectly legitimate practice.

Mr. PREEDY had used Plaster of Paris as a dressing for sealing in Arsenic, and had found it excellent.

Mr. RILOT showed two interesting pieces of old bone work. The first was a case of natural teeth let into a bone plate. The workmanship was almost perfect, and was an instance of the marvellous skill of some of the old bone workers. The other, which was entirely of bone, illustrated quite a different point—the wonderful way in which some badly fitting pieces will keep up in the mouth. The plate had evidently been worn a long time, though it was very roughly made. On the masticating surface of the back teeth a series of small silver rivets had been driven in. Mr. Rilot thought this had been done to restore the bite where the bone had been worn away.

Mr. Matheson thought they might have been put in when the plate was first made. Not having the history of the piece, Mr. Rilot could not say which was correct.

The President then called on Mr. Gask for his paper on "Cocaine." (See page 630.)

Mr. MATHESON, in opening the discussion, complimented Mr. Gask highly on the merit of his paper. He thought that new light was thrown on the subject by Mr. Gask's explanation on the frequent apparent failure of the drug. It was very likely it was due to injection in a wrong direction, so as to anæsthetise the wrong spot.

Mr. BULL asked if the dry salt, hydrochlorate of cocaine was as effectual as a solution. He had not found the dry salt of much use.

Mr. LONGHURST could not agree with the last speaker. He had found that the dry cocaine acted exceedingly well.

Mr. MATHESON doubted if anæsthesia was produced by application of a 20 per cent. solution to the gum, and further pointed out the different idiosyncrasies of patients for the drug. He had given up injecting cocaine on account of the difficulty of finding time to treat the bad effects which sometimes follow its administration. It was useful in cases of difficult and prolonged extraction.

Mr. COLYER thought that cocaine never produced bad symptoms if used fresh. The mischief was due to another alkaloid formed by the degeneration of the cocaine in old solutions. He had found that the sockets frequently suppurated after the injection of cocaine, and he would like to have an explanation of this. In injecting it was best to make the puncture opposite the tooth in front of the one requiring extracting; the needle should then be pushed backward. He had found tabloids of cocaine of great use in stopping toothache; one should be placed in the cavity of the aching tooth.

Mr. CORMACK recorded a case of extracting a lower wisdom complete anæsthesia being produced by external application of cocaine to the gum.

Mr. COYSE agreed with the speaker who said that cocaine did not exert its full effects where there was much inflammation in the parts. This was to be accounted for by the fact that the tissues being saturated with exudation from the blood-vessels, absorption did not take place as readily as usual.

Mr. GASK then replied to the various speakers. The usual vote of thanks was then tendered to Mr. Gask for his paper, and to the gentlemen who had brought forward Casual Communications.

The PRESIDENT announced that the next meeting would be held on the 13th of October, when Mr. W. May would read a Paper on "The Treatment of Children's Teeth."

This closed the proceedings.

Dental News.

At the recent election Mr. W. Mitchell Banks, Mr. Marcus Beck and Mr. John Langton were elected to fill the three vacant seats on the Council of the Royal College of Surgeons. They received respectfully 378, 237, & 185 votes.

LIVERPOOL DENTAL HOSPITAL.

THE supporters and friends of the Liverpool Dental Hospital assembled under the presidency of Sir James Poole, the chairman of the institution, to inaugurate the new filling room for the conservative treatment of dental cases, recently fitted out at the cost of several friends of the late Mr. T. F. Brakell, who was honorary treasurer of the hospital for eleven years.

Sir James Poole said they were met to do honour to the memory of their late colleague, Mr. Brakell, and to formally open the new filling room which was dedicated as a memorial of that gentleman, which would add largely to the usefulness of the hospital, both as a means of giving aid to the poorer portion of the community as well as being an excellent school of dentistry for students. He observed that by the statistics the operation had increased from the small number of 800 in the year the hospital was first instituted to 34,000 last year, showing the need there was of such an institution. He announced the pleasure he felt that their good friend Mr. C. H. Quinby had offered the handsome donation of £20 per annum for the next five years as a prize fund to successful students.

Sir James Poole then declared the addition to the hospital open, and dedicated it to the memory of Mr. Brakell, who, he added, had devoted much time and energy to the interests of the hospital.

A vote of thanks to the chairman was proposed by Dr. Dawson, seconded by Mr. C. Alder, and carried unanimously.

Amongst those present were Dr. Waite, Messrs. J. Wannop, (hon. treasurer), W. L. Jackson, (hon. secretary), R. Edwards (dean), H. C. Quinby, James H. Goodyear, Thomas K. Holden, Charles Alder, J. R. Cassell, J. G. Gemmell, H. E. Brakell, J. V. P. Newton, W. J. Pidgeon, H. Newton Hindley, J. R. R. Scott, R. H. Bates, Alderman E. Grindley, R. I. Powell, M. Alexander, W. Mapplebeck, A. W. Brakell, C. J. Brakell, T. R. Guyler, T. C. Dopson, R. M. Capon, J. Norris (house surgeon), William Hitchon, J. H. Burroughs, and W. Gaskell.

THE Canadian correspondent of the "*Lancet*" writes :—The first death in Canada under nitrous oxide is reported from Montreal. A man aged twenty-four went to the office of a dentist, to have a tooth extracted, and requested to have

nitrous oxide administered. After assuring himself that the patient was not suffering from heart or lung disease, the dentist administered the gas. No sooner had the tooth been extracted than the patient gave a gasp and fell over in the chair. He was placed upon the floor and artificial respiration performed, but without restoring animation. The patient was not under the influence of liquor, and five hours had elapsed since last taking food (breakfast). The purity of the nitrous oxide was tested shortly after the accident by the President of the Dental Association, Dr. Beers, who himself inhaled it from the same inhaler. The verdict of the jury was that the man died from syncope, caused by the administration of the gas, and they exonerated the dentist from blame.

THE INTERNATIONAL MEDICAL CONGRESS.—Every member of the Congress will be at liberty to visit the municipal institutions at any time. For those institutions which are at some distance from the city, or for the inspection of which special preparations are necessary, certain days have been appointed. The programme is as follows: Monday, August 4th, inspection of the disinfection establishments and the slaughterhouse; Tuesday, inspection of the water works at Tegel Lake, and a banquet in the Town Hall in the evening; Thursday, inspection of the irrigation fields in the south of the city; Friday, inspection of the irrigation fields in the north; Saturday, a visit to the lunatic asylum at Dalldorf, followed by a *fete* at the New Palace, the Emperor's residence, near Potsdam. A description of the hygienic and therapeutic institutions of the city, with illustrations, will be distributed among the members of the Congress.

THE SELECT COMMITTEE ON HOSPITALS.

At the eleventh meeting, Dr. Shapurji Dadabhai Bhabha, L.F.P.S.G., L.S.A., M.D., Brussels, a nonconformist minister, who said he also practised medicine in the district of Nunhead. The part paying hospitals starved the local practitioners almost as much as out-patient departments. It would be beneficial to have some system of co-operation between the practitioners and the hospitals. Some of his patients had gone to hospitals. The hospitals which injured his practice were St. Thomas's and Guy's. He asserted that there was

no system of inquiry as to the circumstances of the patients at either the general or special hospitals.

Mr. Brodhurst, F.R.C.S., said he had been surgeon to St. George's, was consulting surgeon of the Belgrave Hospital for Children, and was a lecturer on orthopedic surgery at St. George's. He had been in private practice since 1851, was a member of the Medical Teachers' Association. The funds left for the general hospitals were left for the poor, and if properly used all the hospitals would be rich. They were made solely to benefit the hospitals and the poor, and there was no thought of benefitting the medical schools. Those schools were all private institutions, and even when located on hospital ground they were still private, and were bought and sold. The hospitals were now mere adjuncts to the schools. In consequence of the schools being attached to the hospitals, the management was in excess of that which was needed for the poor. The food was too luxurious, the nursing was fit for Dives, and every new medicine, instrument, splint, or knife must be tried for the sake of the students. Every surgeon had what he chose at the expense of the hospital. As the hospitals were not established for the schools, and the schools were not necessary for the hospitals, they ought to be removed from the hospitals. The out-patient department was totally unnecessary except for teaching. The majority of persons applying to the hospitals needed baths and food, but not medicine. The paying wards had damaged some of the profession more than the out-patient department. If the schools were no longer attached to the hospitals, and the latter resumed the functions for the relief of the sick poor, they would be much richer. There were between 2,000 and 3,000 medical students in London, and the professors, spread over the various London schools, were all badly paid, and so could not devote their whole time to teaching; whereas, if all students were collected at one central school, the professors could afford to devote their whole time to teaching. The students should be divided into classes according to years. At present only one course of lectures was delivered, and there was no change during the year; whereas, if there was a central school with large bodies of students contributing as they would to the central school, there would be something like £100,000 a year at the present rate of fees. The students were now driven into schools. They were obliged to attend to get their certificate. The clinical teaching might be maintained by fees paid by students. I do not consider by

the present system any distinguished men are excluded. The Fellowship of the College of Physicians and Surgeons is open to anyone. It is only a question of work and a certain amount of ability. The witness continued that the examinations in London were by far the most severe. A man rejected at London would go to Edinburgh, and if rejected there would go to Aberdeen. So far as medical education was concerned, he had seen nothing in London at all compared to that which he had seen in Vienna. The clinical teaching given in Vienna was better than in any other medical school in Europe. The cost of such a system was perhaps not a quarter of the system as practised in London. There was much more system in the nursing in England than at Paris or Vienna. I should like to see the out-patient departments removed from hospitals entirely, as they were unnecessary. I do not consider the London students fully competent to undertake the work entrusted to them, but they are more competent than they used to be. Medical men qualified in Vienna are not better qualified than those who go in for the higher qualifications, but as to the majority of men who go into practice they are far better qualified. Theoretical education, as distinguished from the practical, was much better in Vienna than in England. A practical knowledge of surgery could only be obtained by practice. He was in favour of special hospitals, and said he looked upon a cancer hospital as an infirmary. He would like to see some kind of licensing authority before the new special hospitals were started, and he would be in favour of some system of central supervision of the hospitals, although the actual constitution of the authority would be rather difficult, unless it were some kind of Governmental supervision.

At the Twelfth Meeting, Mr. Henry Selfe Bennett, M.D., Cantab., who said his chief practice was in valuing life for insurance purposes in the city. Although there might be some slight errors in the memorandum of the Charity Organisation Society he was inclined to support it. Approximately one and a half million of the people of London received charitable relief, and he thought it impossible that such a large number stood in real need of such relief. He did not think that the public suffered from the want of skill on the part of the medical practitioners in the poor districts who had to charge low fees as the result of competition of the free out-patient department. It was a great hardship to the profession that there should be hospitals with paying wards. It was a malversation of the funds which were left for purely charitable

purposes. The undue competition tended to lower the tariff of the private practitioner, which was already sufficiently low. The only strictly legitimate special hospitals were those for infectious diseases, lying-in hospitals, hospitals for the treatment of acute or incurable diseases, those for the treatment of insanity, such as St. Luke's and Bethlem. Other hospitals which the Witness considered justifiable were those of a distinct nationality, dental hospitals, and those for women who desired to be treated by their own sex. Children can be and are sufficiently treated at general hospitals. In certain cases the cancer and consumptive hospitals were justifiable.

Dr. Sinclair Thomas, M.D., F.R.C.S., private practitioner, and physician of the Kensington Free Dispensary, said a free dispensary was a charity supported by voluntary contributions. There were no beds; it was an extension of the out-patient department. There was a resident surgeon who visited patients at their own homes. All dispensaries should be associated with the hospitals in their neighbourhood, so they might have the power at the dispensaries of sending suitable cases for pressing treatment to hospitals where there were beds and modern appliances not obtainable at dispensaries. The large hospitals might also have their out-patient departments smaller by sending some of the less severe out-patient cases to the dispensaries. He would allow students at the dispensaries and infirmaries. He was in favour of paying hospitals. The system as carried on at St. Thomas's hospital was most skilful, and did no harm to the general practitioner. He would like to see a central board for the supervision of hospitals. I consider the general condition of the larger hospitals in London on the whole satisfactory.

Dr. John William Kay, general practitioner, said he had been practising in St. George's-in-the-East, and suffered from the competition of the London Hospital. Within the past twenty years, seventeen private practitioners have been starved out as the result of the competition of the hospital. In former times such practitioners made great fortunes. It was much more difficult for a medical practitioner to get a living now than in years gone by. There was one practitioner to every 1,000 persons in London, but in his district there was only one to every 6,000 persons. The out-patient department of the London Hospital was a great blessing to the neighbourhood, as it relieved a great amount of suffering. That and the Poplar Hospital were sufficient for the district. The class of persons who now went as a matter of custom

without considering it charity to the hospital for trivial accidents used to go to the apothecaries and pay. Provident dispensaries should be established. The in-patient departments of hospitals should be kept open, but the out-patient departments should be restricted to consultative cases sent there from the various medical clubs. The out-patient departments of general hospitals tended to lower the skill of the general practitioner, and prevented him getting the experience he would otherwise get, and which used to come to him in the old days. There should be some general system of Government supervision over hospitals. The part pay system was very bad indeed. It took away all idea of gratitude. It was much worse than the free hospital, which really was a great blessing. He had two objections to the part pay system in a hospital: one was that the charity might be interfered with, and the other was, it would interfere with the business of the general practitioner.

Mr. Lennox Browne was recalled, and spoke of the desirability of special hospitals for certain diseases. The cost per bed put down by the Charity Organization Society was excessive. He was in favour of some body having control over hospitals. In regard to the Scotch and Irish medical degrees, and the protective system with reference to the London hospital appointments, he held the strongest views. Many good men are excluded from the protective system. There is a gentleman who has recently come to London, and who has been a professor in the Andersonian University of Glasgow, and an examiner for the qualifications of the College of Surgeons of Glasgow, who is absolutely unable to get a London hospital appointment because he does not possess this London degree. It is a hardship to ask a man at 40 or 45 years of age to go through what could be very well done as a student, but which would be hard work at his age. I think that practice obtains in all the hospitals, with the exception of St. Mary's.

Mr. J. F. Garioch, Secretary of the Tower Hamlets Dispensary, White Horse Street, Stepney, said the sweeping statement made by Sir Edmund Currie, to the effect that in the East-end of London there is a large number of dispensaries which were doctors shops, he considered rather reflected upon the dispensaries, which were doing a good work.

At the Thirteenth Meeting, Miss Ellen Mary Yatman, who had been a nurse at the London Hospital for eighteen months, said that very often inexperienced nurses had re-

sponsible duties entrusted to them, and in consequence injuries to patients sometimes resulted. She had suffered in health whilst at the London Hospital. Most of the nurses had suffered in health during the time of the overwork. She went off duty as the result of blood poisoning, evidently due to sewage gas. She said that the food was not as a whole good. The nurses had talked very much about it among themselves, and the home sister knew about it, but she (Miss Yatman) did not think it was any use complaining of the food. The meat for dinner was, as a rule, badly cooked and not good. The only alternative was to leave the food. From her experience, the night staff of nurses was inadequate, especially for the children; and the adult patients often complained of being awakened. The insufficiency of nurses she considered had led to a number of bad results. The patients at the London Hospital did not have the luxuries which some witnesses said were given in hospitals. There was no fancy diet, and she had never seen chicken. Fish diet was sometimes ordered. Children were never given grapes unless brought by the visitors. After about three months, the nurses began to break down. Her complaint was that the nurses on night duty had not sufficient food, and that the day nurses had not sufficient for supper, and that all the food was badly cooked and badly served. An uncertificated probationer might be in charge of a division of the ward. She believed the state of things is exactly the same as when she was there, except that the drains have been attended to. She had known probationers of a year's standing sometimes sent out to nurse private patients.

Miss Raymond, who was a certified nurse at the London Hospital, but who has recently left, corroborated all that the previous witness had stated with regard to the overcrowding, insufficient and bad quality of food, the inadequate staff of nurses, and that inexperienced nurses were given too large a share of responsible work. There is more work to be done than can be done with the present staff, whether medical or nursing.

Miss Dickinson, who in 1888 entered the London Hospital as a probationer, agreed with the previous witness as to the inadequacy of the nursing staff and improper use of inexperienced probationers. The food, too, she said was bad in quality and insufficient in quantity. The wards were sometimes overcrowded.

Miss Page, nurse for some time at the London Hospital, corroborated the evidence of Miss Yatman as to overwork of

nurses and bad food. She knew of uncertificated nurses being sent out to nurse private patients. Her experience at Highgate Infirmary was that the cooking and the nursing there was better than at the London Hospital.

The Rev. H. T. Valentine, late chaplain and now a governor of the London Hospital, and vicar of St. Pauls, Walden, Hertfordshire, said that he was constantly about the hospital, and the result of his observations was to convince him that there were grave abuses in the present nursing system. There were four points upon which he desired to lay special stress. There was an inadequate staff of nurses, and too many paying probationers were engaged. The nurses did not receive proper medical attention when ill. Probationers of much less than two years' service were sent out to private houses as thoroughly trained nurses, and he thought it wrong that a hospital advertising to supply skilled nurses, and receiving substantial fees, should send inexperienced probationers instead. His last point was that probationers' apprenticeships were often cancelled for insufficient reason, and without due investigation by the house committee while nurses were dismissed without proper notice and on insufficient grounds. So strong were his feelings upon this point that he had felt it his duty, as ex-chaplain and a governor of the hospital, to communicate with the committee on the subject.

At the Fourteenth Meeting the Rev. H. T. Valentine resuming stated that he had written the letter of complaint as to the treatment of nurses at the London Hospital, quite independently of Miss Yatman, with whom he had had no communication. What he complained of was that, whilst the probationers had to sign to stay two years, there was no contract on the side of the hospital. He should not have resigned the chaplaincy if he had not received an offer of preferment. The staff nurses and sisters might, as was shown by his evidence be placed in great difficulty by sudden and arbitrary dismissal, and an apprentice might be professionally ruined. He complained as to the status of house-physicians and house-surgeons, and of nurses being left to the charge of untried young men. Ladies did not care to consult lads upon their cases, especially if upon demand they could not see their seniors. It was said that the nurses were likely to malingering. He did not believe that; but, if true, a more practised doctor would discover it more quickly than one of the young men. He said he had found the washing of children in full swing at a few minutes after 4 A.M. in winter. As a rule experienced sisters could manage the patients better than the male attendants, who

in extreme cases only used force, and were naturally not liked.

Miss Yatman was recalled to supplement her evidence. She said there was not sufficient assistance given the nurses, who had too much to do to perform the work efficiently.

Miss Eliza Homersham, one of the General Council of the British Nurses' Association, complained, that when a probationer upon applying to leave to attend her father on his death-bed she had been refused, and was told that the only way to obtain an "honourable release" from her engagement was to remain two years, and pay another 13 guineas, on the assumption that she had continued a paying probationer with the option of resigning. Whilst at the hospital she enjoyed good health; but she attributed that to never trusting to the food of the hospital—always getting her own food—and to plenty of exercise. She said that some of the wards were overcrowded, and that in several cases when Sir Andrew Clark—who strongly objected to overcrowding—visited the hospital, a number of patients in his ward were wheeled out, and within half an hour after he had gone they were wheeled back again.

Mr. W. C. Homersham, brother of last witness, corroborated some of her evidence as to an interview with the matron of the hospital.

Miss Raymond was recalled, and stated that she was dismissed by the matron in the first year of her service at the hospital. It was said I was incompetent, to become a nurse. My friends took up the matter, and I afterwards remained and finished the full term of my two years, and then received a certificate of competency.

Mr. Roberts, the secretary for the last three or four years of the London Hospital, stated that on the medical side all the members of the staff met together in the medical council when summoned to do so to deal with matters in which their interests were affected. In addition to that there was a College Board for the management of the medical school and for the appointment and arrangement of officers. Their duties were restricted to the management of the Medical College. Supposing a case of something wrong with the nurses, or affecting the medical officers, is brought before the house governor, who is responsible for the supreme control of the hospital, and he reports weekly to the house committee. The matron also reports to the house committee. The dismissals are made by the house committee. It is not the fact that dismissals have been carried out by the matron.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the "Editor of the British Journal of Dental Science."

SIR,—For the information of those who purpose visiting Berlin for the International Congress, I may say that I have had some correspondence with Mr. Gooday, Traffic Manager of the Great Eastern Railway. He proposes putting on special carriages from Leeds, Manchester or Liverpool, or other places where sufficient members may start from in connection with the 4.48 p.m. train from Doncaster to Harwich on either July 31, or August 1, as may be most convenient to members. He will also arrange with the Dutch and German Railways for through carriages from Rotterdam to Berlin, and also providing the party travelling together be not less than thirty, he will book them at pleasure party rates, which means a reduction of about £2 2s. on First Class tickets, and £1 12s. on Second Class.

It is necessary he should have ample notice to make these arrangements. Therefore, if those members who wish to avail themselves of same, will communicate with me, immediately this comes into their hands, I will complete the arrangement.

It will be well for those who contemplate the journey, to send for the Great Eastern Continental Time Book; it contains a great deal of most necessary information, also list of hours, which may be taken in conjunction with the Berlin journey.

J. CHARTERS BIRCH.

South View, Brunswick Place, Leeds.

Dental Hospital Reports.

MONTHLY STATEMENT of operations during May, 1890.

	London.	National.	Manchester.
Patients . . .		1910	1137
Extractions . . .	1641	596	510
„ under Anæsthetics	1031	705	144
Gold Fillings . . .	343	141	20
Other Fillings . . .	1144	406	221
Irregularities . . .	80	167	24
Miscellaneous . . .	436	223	265
Artificial Crowns . .	12	15	
Total . . .	4687	2253	1184
<i>House</i> E. PREEDY,			
<i>Surgeons</i> W. R. BARRETT.		WM. FISK	C.H. SMALE.
E. H. L. BRIAULT.		A. MOORE.	

British Journal of Dental Science.

No. 541. LONDON, AUG. 1, 1890. VOL. XXXIII.

THE APPLICATION OF ELECTRICITY IN DENTISTRY.*

By WILLIAM BROUGHTON, L.D.S.

Mr. President and Gentlemen,—Before entering upon the subject of this paper, permit me to disclaim any intention to pose as a practical electrician, or to enter upon the therapeutics of electricity. My purpose is simply to give the results of some experience and research in this agent as applied to the service of dentistry in the surgery and workroom.

To that end I must first direct your attention to the mysteries of Ohms, Volts, and Amperes and their relative values; because that I apprehend it is not so much the construction of the machinery as the principles upon which the machinery is constructed, that knowledge is needed by most dentists to enable them to avoid the mistakes which are liable to be made. Moreover, after understanding the meaning and value of these terms, one is better able to understand the values of the different batteries and accumulators; and also to correctly estimate the amount of current required by the motors, lamps, &c., exhibited this evening; the various capabilities of which I shall endeavour to demonstrate before you.

The Ohm is the unit of resistance, (symbol R) and is the resistance offered to the passage of a current of ampere of electricity by a copper wire of 95 per cent. of conductivity, 10 feet long, .01 inch diameter, weighing 2 grs. per foot.

The Volt is the unit of electromotive force (E. M. F.) which will pass a current of 1 ampere through a resistance of 1 Ohm, and is symbolized by E . It is analagous to the pounds pressure in a steam boiler or water main. The voltage is not dependent upon the size of a cell for its intensity, but upon the affinities of the electrodes and electrolyte, or exciting solution for each other.

We have here an instrument called a Volameter, which is used to measure the voltage of a cell. This we will now con-

* A Paper read before the Manchester Odontological Society.

nect with a current from 1 cell of an accumulator, which has when fully charged an E. M. F. of two volts. Without a sufficient voltage we could not work an incandescent lamp. The lamp I now show you, requires eight volts to light it to its full intensity. Lighted with one cell (=two volts) the light is feeble, but as additional cells are brought into circuit the light increases, until with four cells (eight volts) its full incandescence is reached. It is owing to a lack of knowledge of the fact that every lamp requires a voltage equal to its capacity, that the inexperienced destroy so many lamps. My first experience with a miniature lamp ended in disaster, and necessitated buying a new one at a cost of 12s. 6d. The lamp now shown you I have used for simple examination of the oral cavity for about four years; and it seems as good as when first received. It was made for me by Messrs. Woodhouse and Rawson.

As a comparison for voltage I give the average volts of three well-known batteries; Leclanche, $1\frac{1}{2}$ volts; Daniell, about 1 volt; single fluid bichromate, 1.9 to 2 volts according to the strength of electrolyte. If the cell be of the double fluid, or Fuller type, as it is called, the voltage will not be so high, owing to the resistance of the porous jar.

The Ampere is the unit of current per second, (symbol C.) and represents the gallons of water passing per minute through a given size of pipe. In primary and secondary cells, it is proportional to the surface of plates exposed to the electrolyte.

The Ammeter is the instrument used for measuring this current, the utility of which I shall demonstrate when we come to the practical testing of motors.

It was about the year 1858 that electricity as an anæsthetic received a good deal of attention. Its first discovery for that purpose was claimed by two gentlemen, Mr. Francis, of Philadelphia, and Mr. Morrison, of Edinburgh; but I am afraid, like so many other so-called anæsthetics, its supposed benefits were more due to the novelty than anything else. A friend, who once tried its effects for the extraction of a tooth, said he certainly did not feel much of the extraction, but he felt a great deal of electricity, which made him resolve to bear the ills he knew rather than fly to others he knew not of. I have no doubt there will be those present who remember the elaborate operating chairs of 20 or 30 years ago, with their silver-plated poles attached to the arms, while an assistant was in an adjoining apartment industriously generating

the current by means of a magneto-machine. In those days the patient fully realized the operator's command to stick to the chair when the forceps were applied ; for the muscular contraction engendered prevented him doing otherwise. The Faradaic, magnetic, and continuous current have all been found useful in the treatment of facial neuralgia, but this subject, as before said, will not be discussed to-night.

Electricity for dental purposes, at the present time, is principally derived from two sources, viz., primary batteries and accumulators. But I trust at no very distant date we shall have it delivered to us the same as gas, ready to be converted into motive power, light and heat. We need not pass from this room to appreciate the advantage of electricity for lighting purposes, and we have all admired the excellent and steady light which has been provided for us, whereby we have been preserved from the vitiating effect of gas.

By the kind permission of the Brush Electrical Engineering Company, who supply this installation, I shall be enabled to shew you the conversion of the current into power, by means of a lead from their mains.

Primary batteries are those wherein one or more chemical substances act upon two differently composed plates, causing a decomposition of one of the plates. At the best, batteries are not an economical source whence to derive current, but as we have rather to look at the utilitarian view of electricity, we must under some circumstances be prepared to put up with the disadvantages of recharging, etc. I am often asked how long will a battery last ? This, as a general rule, is always proportionate to the amount of zinc consumed, but more than all to the care in working and amalgamation, for if the zincs be not thoroughly amalgamated, or are left in solution when no current is being taken from them, it is like burning the candle at both ends, but without the evolution of double light.

This leads me to speak of the form of battery for general purposes. This frequently has to be governed by the space at disposal, accessibility of materials, facility in recharging and the required absence of deleterious fumes. The single fluid cells are undoubtedly the easiest recharged and have less internal resistance. The bichromates of potash or soda are mostly used, and act by the chromic acid which is set free by the action of another acid, usually sulphuric. I prefer soda, as it does not form an insoluble chrom alum upon the carbons like potash. Personally I have used chromic acid until I

commenced with the accumulator. In all carbon batteries the plates ought to be removable from the solution, for if the carbons are fixtures, as in the majority of bottle bichromate cells, the acid creeps up the carbon and eventually destroys the connections, unless they are of platinum. The battery I used was one of four cells, the carbons mounted on two parallel bars of wood, separated by blocks $\frac{1}{4}$ inch in thickness; all the wood being well varnished to render it waterproof, and non-conducting. Between the bars is suspended the zinc plate which is held by a simple clamp forming support and connection; by this method a new zinc is quickly fixed or re-amalgamated.

Another very effective single fluid cell is the Sanschoeff; the elements are the same as the bichromate, but the electrolyte is composed of a strong solution of mercuric sulphate in sulphuric acid. The first cost of this battery is higher than the bichromate, but the manufacturers re-purchase the spent solutions, which somewhat reduces its cost. The mercuric solution also serves another useful purpose, viz., the amalgamation of the zinc, which prevents local action and consequent waste of energy.

Among the double fluid type of cell the Fuller seems to be the most effective, of which the Liepmann here shown is a modification. The best and most convenient form for emptying and recharging is the Wymersch which only requires the turning of two taps to empty, and two for recharging; but as at present made is too large for our purposes. It has an E. M. F. of 13 volts, and 15 amperes.

Another form, which was exhibited at the meeting of the *British Dental Association* at Dublin by Messrs. Coxeter & Son and known as the V. P. cell, is said to require little or no attention for six months; but statements like this must always be taken "*cum grano salis*" and at the risk of reiteration, I must warn you not to expect more current than there is acid or other material for conversion. Its construction for all practical purposes is the same as the Liepmann, viz., a row of carbon rods which gives a very large surface, a porous jar containing the zinc with a layer of mercury for amalgamation at the bottom, the outer case being made of wood lined with lead. Mr. Morton Smale had one in use without attention and without recharging from June 1879 to May 1880.

In all batteries when working there is a gradual fall of potential, due to what is called polarisation, which is caused by the formation of a film upon the surface. This sets up a

counter E. M. F. but it may be obviated by moving the plates. It does not occur to the same extent in the double fluid cells.

For occasional examinations by the electric light, the modified form of Leclanche is very useful and requires no attention, but for protracted operations it is of no use, owing to rapid polarisation. The nitrate of soda battery has been strongly recommended as an economical one, but there is an evolution from it of nitrous fumes, which precludes its use indoors. During the past week Mr. Fahrig, electrician, of London, has sent me particulars of a new thermopile, the cost of working which at full power he estimates at one farthing and a fraction per hour. In this apparatus the heat of the gas is used to generate a current by impinging upon two differently constituted metals. This is one of the methods of conversion from heat to current, from which great things are hoped when we shall have electricity direct from coal without the intervention of steam boiler, engine and dynamo. But as yet it has not been produced at the same cost, nor in such quantity, as we get by means of the dynamo. The Gulcher thermopile, the illustration of which I have here, weighs about 20 lbs. and is composed of a number of nickel tubes. Each pile has an E. M. F. of 3.6 volts and 4.5 amperes with a resistance of 1.4 Ohm. and costs in Berlin about £7 10s. per pile.

Without doubt, the accumulator is the best source of power, where there are facilities for recharging. There are no plates to plunge or remove from solution ; and it is ready for action on the turn of a switch.

A few details of the history of its construction may perhaps be acceptable. It is not by any means as recent as some people imagine. Its action was first observed by a French chemist named Gautherot, in the year 1801. The same observation was made in 1803 by Ritter, in Germany, who endeavoured to utilize its reactions. It was at first supposed that the electricity was stored up in the plates, and this view is still held by those who are not conversant with the subject. The chemists were not long in discovering that it was owing to certain substances having chemical affinities for each other, due to their previous decomposition, and which caused a reverse current to be set up.

It was in 1859 that Gaston Plante found that the best effects were produced by two sheets of lead in dilute sulphuric acid ; and it is to his enterprise and genius that we are indebted for the valuable series of experiments which taught us practi-

cally all that is known at the present time of secondary batteries. M. Faure, in Paris, was the next to make an advance in the manufacture of the plates by substituting a paste of red oxide of lead, thus doing mechanically what Plante had effected by the electric current, and so enabling the plates to be formed very much quicker.

It was in May, 1881, that the public were astonished by the statement that a box containing a million foot pounds of energy had been sent from Paris to Glasgow, but which only meant the energy developed by an ordinary engine with one pound of coal. The action and principle of the plates in accumulators is owing to the presence, at the negative plate, of peroxide of lead (Pb. O_2), which yields up in working to the + plate an atom of oxygen, tending to make the two plates more normal, forming protoxide of lead (Pb. O.) on both.

The accumulator now shown is known as the E. P. S., V. type, and has a capacity of 16 ampere hours, with a discharge of one to four amperes at a potential of 8 volts. The E. M. F. is 2 volts for each cell for all sizes and may be had of 660 ampere hours capacity.

In working, it is false economy to run the current down too low, as by so doing the plates are more liable to fall to pieces, causing short circuiting and rapid destruction of plates. The more frequently the cells have a current passed through them, the longer they are likely to last.

Here we have another form of accumulator, or secondary battery, which is said to have the highest E. M. F. of any battery or accumulator; a lithanode plate (that is, a special peroxide of lead) forms the negative, and zinc the positive. In action the zinc is dissolved, and redeposited when recharged. It has a capacity of six ampere hours with a potential of 2.35 volts.

The Cuttriss accumulator is based on this principle. As you see, it is in a much more portable form than the E. P. S., and is supposed to give about the same ampere hours work. It is to be regretted that the cost of platinum will interfere with its manufacture at a reasonable price; for I am told it contains about two ounces of that metal.

Mr. Edison has recently brought out an improved form of the copper oxide battery. The oxide of copper is compressed into solid blocks, and held in position by a light frame of copper for the negative plate, with zinc for the positive plate. A cell $11\frac{1}{4}$ inches high, and $5\frac{3}{4}$ inches diameter is said to have

a working capacity of 130 ampere hours, but its E. M. F. is only nine volts, and when heavily worked falls to seven volts.

A word or two here in regard to hand-pieces and cables, will not be out of place. When first I used the motor I am at present working (an original Cuttriss) I found there was a very great difference in speed when the arm was detached ; in a great measure due to the friction of the cable inside the sheath. I then reduced the length by one half, and gained an increase in speed and power. Afterwards it was still further reduced to its present dimensions, retaining a simple wrist-joint which, together with movement obtained by suspending motor from a bracket above, enables me to use it more satisfactorily. It is raised and lowered to suit the varying heights of the patient, by balance spring and strap. Some twelve months ago I purchased a Hodge hand-piece, but on trial found a considerable reduction in power ; I believe caused by the larger bearing surface as compared with the No. 4, hand-piece, which I soon replaced.

The use of the motor in the workroom has not yet superseded pedal labour; but will, I have no doubt, be extensively used when the house to house supply is fully established.

Not the least among the attributes of utility claimed for electricity is its facility for lighting purposes, having only one tenth the amount of heat for a given candle power of gas. This renders it applicable for the examination of deep seated cavities in the human body. The lamp now exhibited was designed by me for the late Professor Thorburn, and was intended for uterine and similar examinations. Mr. Dickens, of Southport, was the first to produce a lamp for dental purposes, with a circulation of water around it to keep it cool, but it was larger in diameter than the one shewn. A current of water is forced by means of an irrigator into the glass chamber that protects the lamp, which is only $\frac{1}{8}$ in diameter. No current can pass until the apparatus is wound up, and before the water ceases to circulate the current is broken, thus preventing the cracking of the bulb through overheating. For general dental and medical work, this has been superseded by the frontal lamp, which has the advantage of allowing both hands to be at liberty, and requires but a small current to work it, with an amount of light amply sufficient for most dental operations. These lamps are used at a potential of from 3 to 4 volts, the light being focussed on to the work by means of a plano convex lens of short

focus which prevents the light dazzling the patient's eyes. The body is easily removed from the headpiece and adapted to the bracket, which in this case is attached to the stand. This accumulator is intended for the use of medical men. I ran an 8 volt lamp continuously on Friday last for 13 hours, which means 26 hours for the 3 to 4 volt lamps.

The electrical dessicator is for the rapid drying of dental cavities by means of a current of warm air, and consists of a chamber in which there is a coil of platinum or other wire with sufficient resistance to generate heat. A current of air is forced through this by means of an india-rubber ball.

The electric mallet is more generally known than the motor, and many ingenious forms have been devised. I use the Holmes mallet attached to the electro motor, which can be run at any speed by means of the Cuttriss resistance.

Besides these useful appliances for the operating room there are many purposes to which electricity might be put. Among the rest may be named Mr. Simms' magnetic screw driver, the electric bell with its system of signals, which I have attached to my chair, enabling me to signal without attracting attention and to save valuable time. The telephone is also useful for communication with distant parts of the house, but for short distances, I prefer the ordinary tube.

Motors next claim our consideration, and I shall endeavour to demonstrate by practical tests the various claims for efficiency and economical working.

The motor first exhibited is the very latest of Messrs. Cuttriss. It has an arrangement for immediate stoppage, also a current reverser, and has no dead points. It has also a new regulator, where little power and slow speed are required and works with a potential of 8 volts and a current of 1.3 amperes giving about 1580 revolutions per minute. The next is the Detroit and with the same potential requires a current of 2.5 amperes and gives 1550 revolutions per minute. This motor has a reversing movement and also no dead points.

Next we have the Griscom, which is a very neat looking motor, but unfortunately has a dead point, and is rather difficult to start owing to the build of the field magnets. This requires a current of 2.1 amperes and gives 1800 revolutions per minute.

The fourth motor is an earlier pattern of Messrs. Cuttriss, and requires a current of 1.3 amperes, giving 1100 revolutions per minute.

The last motor I have to show you is one of Cuttriss's first

pattern, but it certainly is not the least efficient. It possesses the disadvantage of having a dead point, but it can easily be started by a slight touch of the armature. This motor is the one I am at present using with the shortened arm-piece before described. With this arm-piece it requires a current of 1.2 amperes, and gives 2250 revolutions per minute.

Before closing I must acknowledge my indebtedness to the British Electrical Supply Co., the Eddison Co., Messrs. Curtis & Co., and others who have so kindly assisted me in providing instruments, motors, &c.

AN ANALYSIS OF A SERIES OF ONE THOUSAND NITROUS OXIDE ADMINISTRATIONS RECORDED SYSTEMATICALLY.*

By J. SILK, M.D.,

Anæsthetist to Guy's Hospital Dental School ; to the Royal Free Hospital ; and to the Hospital for Epilepsy and Paralysis, (Queen Square.)

MR. PRESIDENT AND GENTLEMEN,—In offering to read a paper before this Society upon such a well-worn subject as nitrous oxide, I feel that I am undertaking no light task.

Not only must the dental profession be considered, for obvious reasons, the godfather or guardian, so to speak, of this robust and flourishing child, and naturally, therefore, particularly well informed as to its character, temperament and idiosyncrasies, but this Society includes in its list of Members such names as those of Bailey, Braine, Dudley Buxton, and others, who have already contributed papers on the subject far more able, and of far greater scientific value than I can hope to lay before you. I should like, therefore, at the outset, to be permitted to explain the object I have in view in appearing before you to-night. This object is twofold :—

1. In the first place, I wish to insist upon the importance of keeping systematic records of *all* gas administrations. Whether the individual cases present features of special interest or not, I hold that they should always should be

* A Paper read before the Odontological Society of Great Britain.

recorded, for by this means alone can we hope to explain satisfactorily the many curious anomalies met with in practice.

2. In the second place I wish to give you an example—an imperfect one though it be—of such systematic records. For which purpose I have analyzed the first thousand cases that I have myself recorded upon a definite plan; not, I would have you to understand, because I think I have been enabled, by this means, to make any startling discoveries, or to explain any of the curious anomalies referred to, but rather with a view to point out what some of those anomalies are, and to obtain your assistance in the work of explanation.

I.—To thoroughly appreciate, and correctly explain, the action of a drug upon the human body, it is essential to compare the facts obtained by three distinct methods of investigation, viz., the physiological, the pathological and the clinical. Now, as far as nitrous oxide is concerned, the happy absence of *post-mortem* records, though a matter for sincere congratulation, practically eliminates, or at least seriously limits, the pathological element; and although there is probably still much to be learned as to the physiological action of the gas, we must, I think, be careful to bear in mind the lesson of a recent “Commission,” and must hesitate to dogmatise upon the action, or the method of administration of a drug, when our experience is obtained solely in the physiological laboratory, or at best, simply corroborates the experience of one clinical observer.

Physiological investigations, such as those so ably carried out by Dr. Dudley Buxton, and with which you are doubtless all familiar, combined with the clinical observations of many, are the desiderata. Questions of time and opportunity, to say nothing of ability, practically exclude the majority of us from the laboratory, and it becomes all the more necessary, therefore, that we should each of us endeavour to add to the common stock of knowledge in some other way, and this we can do by keeping clinical records of our cases. The necessity and advantages of keeping records has frequently been insisted upon by far abler men than myself, and I need not therefore say anything upon the subject; the question is rather as to the best way of keeping such notes, that is, of the way which will meet with the readiest acceptance at the hands of the profession, and will therefore be likely to furnish us with the largest number of, and most uniform observations. In

deciding this point we must bear in mind the peculiarities of the case, and must recollect—

1. That the patient, as a rule, is a comparative stranger to the anæsthetist, who, for details as to past and family history, must depend upon such information as a third person—often a stranger also—is able and willing to afford.

2. That physical examination and undue cross-questioning are frequently resented, nor do I think that they are often advisable.

3. That the phenomena observed are purely objective ; subjective sensations, often of such value in other departments of our art, cannot here be relied on.

4. That the whole duration of the process is so very short, and so much has to be done in the time.

5. That it is but seldom that we can obtain any information as to the after-effects of the administration.

Taking all points into consideration, I myself came to the conclusion, that the end I had in view might be best attained by the use of some tabular arrangement. I therefore drew up the form which I hand round, and having used it myself for recording nearly 3,000 cases of various sorts, I propose to present you to-night with a sample of the knowledge which such use has furnished.

With regard to this particular form, I think I may say at once, that I have come to the conclusion that it is rather too elaborate for general use ; but at the same time I am convinced that, with some slight modifications in the direction of simplification, it is capable of doing good service, though I admit that it is open to objections which apply equally to all “formal” note taking.

II.—I now come to the second portion of my subject, viz.: the analysis of cases.

In Table 1. I have briefly summarised the various points to which I propose to draw your attention, with greater or less detail according to the time at my disposal. My observations have been arranged, as you see, in three main divisions, viz.: antecedent conditions, phenomena, after-effects. The subdivisions represent, as nearly as possible, the headings of the several columns in the form handed round.

TABLE I.
GENERAL SUMMARY.

ANTECEDENT CONDITIONS :

Sex.
Age.
Physical State.
Consecutive Administration.
Gas used.
Time.
Methods.

PHENOMENA :

Respiratory.
Circulatory.
Muscular.
Nervous.
Digestive.
Genito-Urinary.

AFTER-EFFECTS :

Immediate.
Remote.

First as to sex and age. For the sake of convenience I have thrown together in Table II. some details upon these matters ; the points are, perhaps, interesting rather than important, and I hardly think, therefore, that I need detain you on these grounds.

TABLE II.
DETAILS OF SEX AND AGE.

	7 years and under	8-14	15-49	50-60	61-70	?	Totals	Aver- age Age
Males ..	3	25	201	8	3		240	24·18
Females	4	50	681	15	4	6	760	24·32
	7	75	882	23	7	6	1000	

Next as to physical and mental states prior to the administration. In 263 instances notes were made ; in the majority of course, the conditions recorded were trivial, such as nervousness, &c., and could not be said to have any direct bearing upon the course of the administration, in others, however, some such influence appears to have been exerted, for instance :—

In notes of 21 cases of more or less marked neurotic troubles (other than simple nervousness), to some of which I would refer.

In two of these there was a family history of insanity, and in both the administrations were troublesome, and gave rise to much hysteria during the process of recovery.

Another, an elderly man, had himself been in an asylum. To him I administered on two successive occasions, and on each there were very marked rhythmic movements of the legs as the gas began to take effect. Similar movements were also observed in the cases of two imbecile children, and I shall refer subsequently to the occurrence of this phenomenon in others.

One woman, æt. thirty-three, was suffering from the effects of a former hemiplegic attack, partial loss of power in the limbs of one side being associated with a certain amount of contraction. She, too, developed, on two occasions, the same rhythmic movements in the *affected* arm, and also noticed, as a remote after-effect of the first administration, that the hand, usually so cold, became, as she said, "hot and congested" for the remainder of the day. May not these subjective sensations, if confirmed, afford clinical proof of the dilatation of the blood vessels, which is said to take place during administration?

I have, I find, notes of only three cases of "fits," i.e., of administrations to patients subject to epileptiform seizures; in two of them, however, the record is interesting. One, an otherwise healthy girl, æt. eighteen, took gas twice at an interval of some days. On the first occasion, beyond a slight tendency to episthotonos, nothing noteworthy occurred; on the second occasion, however, after a few inspirations, she attempted to remove the face-piece and speak, but was restrained. She subsequently explained this movement by saying, that she felt a peculiar sensation across her forehead, such as usually preceded her fits. In the second case, a female, æt. twenty-five to thirty, the twitching usually observed at the height of anæsthesia, was of so marked and clonic a character, as to raise a doubt in my mind as to how far it was simply an exaggeration of the usual phenomenon, and how far due to a "nerve storm."

Of definite and undoubted cases of phthisis, I have only records of four cases, nor can I say that any of them developed symptoms of after-effects at all out of the ordinary.

In actual valvular lesions of the heart, I only administered knowingly in three cases. Two of these do not call for remark; the third, however, is interesting. It was the case of a female, æt. sixteen, who had previously had an attack of

acute rheumatism, and when I was first asked to anæsthetise her, a very marked mitral bruit was audible over the apex and right round to the angle of the left scapula. To this girl I administered four times in all, at varying intervals of between seven and fourteen days. On the first occasion it is noted that the lividity, though not over marked, appeared to be more lasting than usual, and this was also the case on the second occasion, when the administration was pushed a little farther and there was in fact a distinct tendency to syncope. On the third occasion, the temporal pulse intermitted comparatively early in the course of events, and it was reported that since the first administration the nocturnal cough had become more marked. On the fourth occasion, it was simply noted that she quickly passed under the gas, and was profoundly anæsthetised. Such a case as this seems to me to point to the conclusion that, although nitrous oxide may be safely administered in cases of valvular cardiac lesion, its re-administration at short intervals is contra-indicated. But here again further clinical study is desirable.

Some of you may recollect a paper written by M. Laffont, and published in Paris some few years back,* in which the author drew a somewhat appalling picture of the evil effects of the gas upon the diabetic, the pregnant, and others. With regard to the first, such evil effects did not follow in the solitary diabetic whose case comes within this series, and to whom I administered twice. As to the pregnant, I have administered to nine such in various stages, and in seven of them, at least, I should have been almost the first to have received warning had anything gone wrong. As to the phenomena associated with this condition, I may mention that on two occasions, when the pregnancy was at a very early stage there was a very decided tendency to vomit, both in the very earliest stage of the administration and after recovery, and the same thing occurred in a patient at the fifth or sixth month; and in five out of the nine more or less hysteria is noted. Of the four cases of lactation which I have noted I cannot say much. With one exception I heard no more of the patients; in respect to the one I was told that she was fairly well for the remainder of the day of administration on the following day had "a bilious attack," and the baby was very poorly. The question of the influence of nitrous oxide upon lactation is one of very great interest and consider-

* Comptes Rendus Société de Biologie, Paris, Vol. XII., No. 37.

able practical importance, and to which, therefore, I hope attention will be directed.

By consecutive administrations, I mean administrations undertaken within a few minutes of previous ones, the patient being allowed to recover completely in the interval. I have sixty-five records of such administrations. Of these sixty-five more or less decided retching was developed in 12 per cent., going on to actual vomiting in two cases. In two instances, too, the condition of the patient was such as to necessitate pulling forward the tongue with forceps, and in 9 per cent. there was marked hysteria with crying and screaming on recovery. As to the remote effects of the gas in these cases, I have only been able to secure records in nine cases, but of these, in at least six, the records are unfavourable. On the other hand we must recollect in the first place, that in 73 per cent. of these cases there was nothing to call for remark, either in the way of immediate or remote effects, and in the second place we must bear in mind that in cases calling for consecutive administrations, the operations performed are usually of a severe and prolonged character, and should therefore bear a part of the blame.

From twenty-eight observations made in administering to 293 cases, I obtained an average of about three gallons of gas used in each case, but I think I may mention that more recent observations have led me to the conclusion that this average is slightly too low, but for serial cases, as in hospital work, I am inclined to think that between four and five gallons should suffice.

As to the time required to induce anæsthesia, *i.e.*, from the application to the removal of the face-piece, I have made eleven observations, and find it to average 67·5 seconds; but I have had very considerable difficulty at arriving at a fair estimate of the duration of anæsthesia. The variations have appeared to me to be so extraordinary, that I could hardly give them credit; this, I think is probably due to the rough and uncertain methods employed for determining the existence or absence of the anæsthetic state. The conjunctival reflex is not, to my mind, very reliable either one way or the other, while, on the other hand, exaggerated reflex movements of the limbs are, as we know, not at all uncommon under gas, and by no means indicate a return of consciousness. In this connection I may possibly mention, that in some 400 cases the duration of the anæsthesia has sufficed for the extraction,

on the average, of 2·2 teeth per case, but of course that gives us no idea of the actual duration of anæsthesia.

I now come to the methods of administration employed in this series. In the majority of instances, the apparatus used was either the identical one shown, or one of similar but larger pattern. In forty-four cases the gasometer was used. In 467 cases the gas was administered quite pure ; for experimental purposes, however, I have, in the course of this particular series, made use of the supplemental bag, or its substitute, on 502 occasions.

Now much discussion has arisen, and many hard words have been used, in respect to the use of the supplemental bag and the re-breathing of expired gas, and, therefore, the clinical experience derived from systematic records, such as I am bringing before you, cannot but be of service. In Table III. I have endeavoured to summarise the effects of these two methods of administration. You will see at once from this Table that as far as the immediate after-effects are con-

TABLE III.

METHODS.

	Total Obsvns.	Effects.				
		Immediate.		Remote.		
		Nil.	Bad.	Obsvns.	Nil.	Bad.
Pure	467	81·16 o/c	18·84	28	39·28 o/c	60·72
Supple- mental	502	75·9	24·10	33	48·48	51·52

cerned, the preponderance is very decidedly in favour of pure gas ; on the other hand the reverse would almost appear to be the case with regard to remote effects, but I am inclined myself to think that this is rather apparent than real, and is due in great measure to the necessarily small number of cases in which any record can be obtained. I think, however, that I ought to mention here, that I have more than one remark in my note book, to the effect that I was inclined to believe that the use of the supplemental bag tended to accelerate the onset of anæsthesia, and, therefore, that comparatively less gas was inhaled than would be required if given pure.

I now pass to the consideration of the phenomena.

In respect to the respiratory system I shall say but little, wishing to avoid entering the debatable ground as to the specific or the asphyxial action of the gas.

With regard to the circulatory system, I send round some pulse tracings for your inspection. The diagram I show will be recognized by you all as being taken from one of the many excellent tracings made by Dr. Dudley Buxton, by whose kind permission I exhibit it this evening. Dr. Buxton's tracing is, if I may so term it, a model or standard tracing, and, if I understand rightly, was taken under exceptionally favourable circumstances; such a tracing as Dr. Buxton's, we can hardly hope to obtain in ordinary every-day experience, but the effect of the administration upon the pulse of any given individual is fairly accurately recorded in the tracings I send round. At the same time, however, you will observe that there is a strong family resemblance between Dr. Buxton's tracings and my own, i.e., general acceleration of pulse, loss of tidal wave, accentuation of the dicrotic curve, increase in heart force.

With regard to the muscular system, there are two points to which I should like to draw your attention. First, the occurrence of "rhythmic movements" of the limbs, such as swinging the legs, beating time to music with the hands, &c. In the course of this series of cases I have noted such phenomena twenty-seven times; to some of these I have already referred, but I must confess that, with these exceptions, I am quite at a loss, not only as to its explanation, but also as to the class of patients in whom it may be anticipated.

That patients should pass into an opisthotonic condition is, perhaps, quite natural, especially when we consider the exaggerated condition of the spinal reflex movements, but at the same time I am far from sure that such opisthotonos is invariably associated with profound anæsthesia, as it should be if simply physiological. It certainly appears that the phenomenon in question is more frequent in females and in children under fourteen, as might have been expected, but such a fact only renders an explanation of the following case more difficult, viz.:—A man æt. twenty-four, apparently robust and healthy in every respect. I administered to him on five different occasions at varying intervals, and on each occasion he developed the most violent opisthotonic spasm, sometimes before, sometimes immediately after the face-piece was removed, sometimes early, sometimes late in the course of

inhalation. Needless to say that every conceivable "dodge" was tried to prevent the onset of these troublesome spasmodic attacks, but without success. Such cases as this are luckily rare, but when they do occur are very embarrassing.

I now come to what I consider to be the most interesting feature of this analysis, viz., the condition of the pupils. It is pretty generally asserted that during the inhalation of nitrous oxide the pupils dilate widely, and this assertion is made in such a manner as to lead one to suppose that this dilatation is of such constant occurrence as to be almost a sign that the anæsthesia was approaching completion. As to the exact value to be attached to pupil variations, either in nitrous oxide narcosis or during the administration of chloroform, ether, or any other anæsthetic, I am not prepared to say, but I venture to think that such irregularities are nearly as common in the case of nitrous oxide, as they are with the other anæsthetics.

On 797 occasions in this series of cases I have made notes as to the condition of the pupil. Actual measurements of the pupil are, of course, difficult to obtain in any event, but more particularly during the hurry of nitrous oxide administrations. In sixty-four cases, however, a rough attempt at measurement was made, both before inhalation and at the height of anæsthesia, by means of a slip of ivory, on which were printed in black accurately measured discs, of various sizes, which could be contrasted with the pupils. Of course this plan is, as I say, rough and far from accurate, but still, I think the results so obtained are worth considering. In these sixty-four cases, the average size of the pupil before the administration was commenced was 3.64 mm. At the height of the narcosis the average size was 5.5 mm., i.e., there was an average dilatation of 1.86 mm. Such a degree of dilatation is no doubt quite appreciable if we note the condition of the pupil beforehand, but I doubt very much whether a pupil of 5.5 mm. is what most of us mean when we speak of "a dilated pupil."

Of unmeasured cases I find that I have noted decided dilatation in 366; more or less dilatation in 96; little or no dilatation in 194; dilatation followed by contraction, 20; after dilatation, 15.

You see, therefore, that although the pupil dilates in the majority of cases, the exceptions are sufficiently numerous to attract attention. But, it will probably be asked, are there

no circumstances connected with these individual cases which may or may not account for these variations?

Taking, then, the 194 cases in which the dilatation of the pupil was either quite inappreciable or did not occur at all. In Table IV. I have analysed these cases, and at the same

TABLE IV.

	Undilated Pupils.	Whole Series.
Total Observations	194	1000
Males	25·77 o/c	24 o/c
Females	74·22	76
Children	7·2	8·6
Over 50	5·15	2·5
Pure	52·57	46·7
Supplemental	47·42	50·2
Extractions	2·2	2·2

time have compared them with the percentages of the whole series of 1,000 cases. It appears from this table, therefore, that non-dilatation is of more frequent occurrence when the gas is made pure, in people over fifty, and in males. You will see, too, that the average number of teeth extracted is the same exactly as the average for the whole series; *a priori* therefore, I think it may be safely assumed that the degree of anæsthesia was about the same in both cases, and, I may perhaps add, that twitchings, jactitations, stertor and marked lividity were noted in nearly all—certainly in 90 per cent.

Then again there are twenty cases in which I have noticed a primary dilatation, followed by more or less contraction. This seems certainly much more likely to occur in men than in women, and when the supplemental bag is used. But the total number of cases observed is, I think, hardly sufficient to eliminate possible sources of error, such as air leakage.

As to the after-dilatation of the pupil I shall hope to refer to this later. I think, however, that I have said enough to

show you that, as far as my own observations are concerned, they tend to prove that other phenomena, leading us to discontinue the inhalation, may occur prior to pupil dilatation, which cannot therefore be relied upon as a test or sign of the completion of the narcosis.

I have already partly referred to the phenomena associated with the digestive system, while discussing the subject of consecutive administrations, when I endeavoured to point out that in such cases vomiting was particularly likely to occur. I have noted it under other circumstances, but have hardly time to allude to it again.

I feel, however, that I must say something with regard to micturition and of the development of erotic symptoms. In respect to the former there are exactly ten cases noted in this series, and as it is an accident easy of detection, I think 1 per. cent. may be looked upon as a fairly accurate average. Of these ten cases all are females, two are in children under fourteen, the remainder between that age and forty. Although the absolute number of children in which the phenomenon occurred is small, it is relatively large, *i.e.*, 20 per cent. and it must be borne in mind that of the whole 1,000 cases only 8 per cent. are children. In three out of the ten cases opisthotonos was noted, and in a fourth there is a note to the effect that the patient was deeply under, and in a fifth considerable force had to be used in the administration, and there was consequently much shouting and struggling. I may mention, too, that in seven out of ten cases the gas was given pure. As to erotic movements and sexual phenomena, I can only say that such events have occurred, undoubtedly, in six out of the whole series, and these, with one exception, in young unmarried girls under twenty-four. The exception was in a married woman *æt.* thirty to thirty-five who, as I subsequently ascertained, was in an early stage of pregnancy.

Before leaving the subject of phenomena, there is one point to which I would draw your attention, *i.e.*, the intensification of the stertor, lividity, muscular movements and other signs of profound narcosis, which may momentarily occur immediately *after* the removal of the face-piece. My attention was only directed to this point some little time after I had commenced keeping these records; I am afraid, therefore, that the figures I bring forward will not convey to your minds a very accurate idea of the frequency with which this after-intensification takes place. The total number of cases observed does not, in this series, exceed fifty, of which 30 per

cent. are males and 70 per cent are females, *i.e.*, relatively a larger proportion of males. I may, perhaps, be allowed to state, that subsequent observations lead me to incline to the belief, that such after-intensification occurs in a very large proportion, if not in all cases; and I venture to think that it is a point of very considerable practical importance, and one worthy of further study.

Finally, gentlemen, a few words as to what I have termed remote effects of the gas, *i.e.*, the effects which follow after the patient has left the house or hospital. You will, I am sure, appreciate the difficulty of obtaining anything like accurate records in this direction, and I have not in this series, made any special attempts to obtain anything like the number of records that would be desirable, in order to determine exactly the remote results of nitrous oxide administration. I merely give the figures for what they are worth; the majority, as you will observe, have already been discussed under the heads of consecutive administration and methods. Of such remote effects, then, I have seventy-six records. In 42 per cent. of these the record is *nil*, and of the remainder the effects appear to be limited to headache in 15.5 per cent. A curious point which comes out in studying these remote effects of the gas is, that in a very considerable number of instances it has been reported to me, that although the effects of the gas during the remainder of the day of inhalation, have been practically nil, yet, on the day following, more or less unpleasant effects have manifested themselves, such as headache, depression, lassitude, &c. If this point were capable of thorough investigation, I should not be surprised if it were the rule rather than the exception, for I can readily understand that the exhilarating effects of the gas may last for some little time, and may, in turn, be followed by a certain amount of re-action.

In conclusion, gentlemen, allow me to remind you again that I lay no claim to originality, nor do I profess to have made any great discovery. My aim has rather been to insist upon the fact that outside the field of original research, to which but few of us can obtain admittance, there still remains the vast domain of clinical investigation, which all of us are qualified to enter, and in which there is still much excellent work to be done; and my analysis of a limited number of cases must be taken as a sample of such work, rather than as a serious attempt to solve any of the difficulties met with in practice.

RUBBER GUM FACINGS ON DENTAL PLATES.

BY N. MORGAN, D.D.S., Springfield, Mass.

THE construction of a denture with a rubber base is a comparatively simple matter, and the process so familiar that any suggestions regarding it may seem unworthy of your notice. Yet though we may be very familiar with its essential details are we satisfied if we are masters of only one method of performing an operation? The requirements are such that we need to have different methods at our command that in any given case we may be fitted for the service required.

It is for this reason that I present for your consideration the subject chosen. Not that I expect or desire that you should in future confine yourselves in this department to the use of *plain teeth* and *pink rubber gums*, but that this may prove one of your resources in an emergency. That instead of being restricted to the conventional use of *gum block teeth* and the distortion of features result, out from their use you may gain such results that it can hardly be suspected and much less known that the person is confined to artificial substitutes. I would not have you understand me as in any way speaking derogatory of "gum teeth," for that is not my desire. I fully recognize their usefulness and beauty in all cases where the conditions warrant their use. I affirm, however, that though the market affords us so great a variety of them in a large percentage of cases the most artistic results cannot be attained by their use.

With the use of *plain teeth* the opportunity of displaying skill and taste are endless. They may be inclined inwardly or outwardly, partly turned, separated, or crowded and lapped, one longer or shorter than others, or one interposed which is somewhat off colour, similar to a tooth with dead pulp. Fillings may also be inserted if so desired.

That our pathway is not "strewn with flowers," even after having chosen plain teeth for a given case, is soon proven, for in this method we must seek some substitute for the gum portion. There was a time when we hoped that celluloid would realize to us all our demands, and temporarily it was very beautiful; but it soon proved as delusive as an *ignis fatuus*. At present our own resource, imperfect though it may be, is some one variety of pink rubber. Being an imperfect substitute we must in some way avoid this misfortune.

In other words it must not be permitted to show so much as to be noticeable, otherwise the result may be as disastrous as though gum sections were chosen. It is an old saying that "what is worth doing at all is worth doing well," and this applies as truly to the fabrication of an artificial gum as anything else.

Such dentures which have come under my observation do not justify me in always using words of praise. In some cases the rubber is permitted to so encroach on the teeth as to prove a serious blemish ; many times also the base rubber is exposed in large or small patches causing a very unsightly appearance. In other cases the entire position outside the alveolar border is of pink rubber, and even shows itself in patches on the lingual and palatal portions of the plate. Some who are more painstaking in their operations to secure desirable results resort to two vulcanizings, the first for the base and then excavating for the inlaying and vulcanizing the gum. This is the method given in the *American System of Dentistry*, and is practised at the expense of much labour, and does not result in as strong a plate as if vulcanized but once. Many of us have doubtless had experience with the use of celluloid, and know all about its fickleness. I rejoice, however, that though in itself essentially a failure it resulted in good in that it revealed to us the desirability of more frequently using plain teeth. Since that time plates with gum facings have been a study for me, and the result is my present method for their fabrication. I may remark that the method is not alone applicable to entire rubber plates, but also to all cases where the teeth are attached to the plate with this material. If you will now follow me carefully I will endeavour to make the way plain to you. The teeth selected should be of such length as to show sufficiently and yet reach so high as not to expose much of the gum in laughing. Their length need not be noticeably out of proportion ordinarily to attain this end. They may of course at this time be arranged to suit the taste of both operator and patient—perhaps—and if a single set, to harmonize with the occluding ones. A discoloured tooth, preferably a lateral incisor, representing a tooth with dead pulp, may at times be interposed with good effect. Where there are but few occluding teeth improved, masticating surface may at times be secured by the use of bicuspid in place of cuspids. These, if suitably modified by grinding, may also make an improved appearance. If the case demands a very thin gum the teeth should be

ground to set very close to the alveolar ridge, and in *every* case their cervical edges well bevelled toward the face side. This is to assist in securing even, curved lines of the gum, and also to prevent the tooth margins being chipped in finishing.

The waxing up of the model plates is one of the most important steps in the whole process, and all contouring, and determining thickness of plate, should be arranged at this time that there may be no excessive amount of filling and scraping later. Before imbedding the case draw a line on the wax which shall be precisely what you desire for the upper margin of the gum, and when investing let the plaster come as evenly as possible to that line. Fill the other part of the flask as usual. In opening warm just sufficiently to avoid any breakage of the plaster, and also retain the trial plate in as perfect a condition as possible that it may be a guide to the amount of rubber required in packing. Cover the model with tin-foil well burnished. The waste gates must be cut from the posterior palatine portion backward and *never in any other portion*.

In packing, commence with the base plate rubber and pack about the pins of the teeth till the pins are well covered. Then of the pink rubber cut little oblong pieces perhaps an eighth or a sixteenth inch in size. These are to be packed between the teeth at the cervical portion, to serve for the gum margins. If the waxing outside the ridge was *thin* the next step will be to cut a strip of the pink rubber of a width to reach from the other rubber (which covered the pins) to the edge of plaster which fixes the height of the gum. The length of the strip should be sufficient to include the teeth. This should be laid very evenly in place and there carefully covered with a similar piece of the other rubber of a sufficient thickness that the two will at least equal that of the model plate in that portion. It is at times necessary to warm and stretch the dark rubber very thin to attain this result. If the waxing was *thick* it would be better to use two thicknesses of the pink rubber. If the edges are now found to be above the edge of plaster, they should be trimmed evenly with scissors. The palatine portion may now be packed in the usual manner. The last step in packing will be to fill *very evenly*, with the dark rubber, the groove around the cast in the outer part of the flask. This forms the portion above the gum line and its evenness depends on these lines being made and kept perfect.

These two sections are now to be united and placed in the spring press in such a way that the anterior portion will come together decidedly in advance of the posterior. This is to force all the surplus rubber backward and so prevent displacing that portion forming the gum.

In finishing the plate there will be no danger of exposing the dark rubber through the facing unless the waxing was such as to necessitate such reduction in thickness. In polishing I first use duck or felt wheels and wet pumice stone. For the cervical portions (which troubles most operators) I use a small stiff brush wheel, with the bristles cut down to not more than one-fourth inch in length, also with wet pumice. Brush mostly from tooth to gum, constantly oscillating the case to prevent forming grooves and this part will not prove very difficult. The final polish may be secured by means of soft brush wheels and chalk.

If these directions are carefully followed, the resulting plate will present well defined gum lines and there will be no exposure of pink rubber beyond its borders.

Instead of the haphazard, unreliable and uncertain methods commonly practised, this gives us assured results.

The improvement we still demand and which we trust will ere long be given us, is a plastic gum which will truly represent nature.

ANTISEPTICS IN DENTAL PRACTICE.*

By GEO. A. MAXFIELD, D.D.S., Holyoke, Mass.

IN presenting this paper I do not come before you as a specialist or as an expert in bacteriology, and, therefore, cannot present the result of original investigations.

To members of the dental profession as well as of the medical profession, this is an all important subject. My aim will simply be to gather together some of the facts that such men as Black, Miller, and others have fully demonstrated, and to endeavour to show the practical benefit which may be derived from them.

* Read before the Vermont State Dental Association, held at Bellow's Falls, March, 1890.

To Pasture's observation we owe the first practical benefit of antiseptics in surgery. He* was the first to claim that the process of fermentation, suppuration and decomposition, as well as the presence of contagious disease, was due to the presence of a living organism which he termed "contagium animatum," and he proved that these processes might be prevented by forestalling the access of the microbe. Pasteur, however, was not the first to discuss some of these facts. In 1836 Caignard de la Tour demonstrated that the yeast cell was a microscopic vegetable cell, which by the increase of its cells broke up sugar into alcohol and carbonic acid. In 1837 Schwan demonstrated that meat and other substances containing albumen became decomposed by germs existing in the air. Among the first to apply the observations of Pasteur to the practice of surgery was Joseph Lister. In September, 1867, he published an article entitled "On the antiseptic principle in the practice of surgery." In this article the word antiseptic was first used with its present signification. Lister's views as then set forth in regard to wound treatment are still accepted and are : "Decomposition in a wound and affections of wounds due to decomposition, are intimately connected with micro-organisms coming from without. The wound treatment and dressing should prevent the access of micro-organisms, and if notwithstanding every care these gain an entrance, they should be destroyed or rendered incapable of harm. The dressing and the substance used for killing the micro-organisms should not irritate the wound at all, or at best very little."†

Following Lister came Robert Koch, who, by his methods of making pure cultures, and by the logic of his experiments and conclusions, has clearly demonstrated the power of the various antiseptic agents to kill bacteria or to prevent their development. We are indebted to these three men more than to any others for our knowledge of the action of bacteria. The experiments and observations of many men of science proved the position taken by these men, and it became an axiom in surgery that inflammation, suppuration and wound diseases are the direct consequences of the action of micro-organisms.

By‡ the result of many observers, it is proven that micro-organisms are absent from the fluids and tissues of healthy

* "Antiseptics and its Relation to Bacteriology," by Dr. J. Neudorfer, Wood's Monographs, Vol. 3, No. 1.

† Ibid.

‡ Ibid.

human and animal bodies and that in health the epidermis, fluids and tissues of the body protect against micro-organisms ; that in case of wounds, surgical operations where the epidermis has been injured, or when through disease the epidermis has lost its impermeability, the entrance of micro-organisms becomes possible and these cause inflammation, suppuration and the various wound diseases.

It has been proved also that many internal diseases are due to micro-organisms. Koch demonstrated that tuberculosis was dependent on the tubercle bacillus, by showing that the bacillus was never lacking in a tubercular individual, and that this micro-organism could be cultivated outside of the individual and remain ever the same ; also that the inoculation of an animal with this cultivated bacillus, taken from the first or even from the twentieth generation, would produce tuberculosis. Beside this the cholera or comma bacillus, Obermayer's spiral bacillus of recurrent fever, Neisser's gonococcus of gonorrhœa, and the typhoid fever germ, have been fully demonstrated ; but the supposition that malaria, croupous pneumonia, syphilis, measles, small-pox and whooping-cough are caused by germs, is not yet proven. It is also known that every kind of pus contains a micro-organism and on account of its racemose shape Ogsten called one the staphylococcus pyogenes aureus. The coccus is widely disseminated through the atmosphere and is singularly resistant to reagents ; it may be dried, baked, treated to chemical reagents and yet be neither killed nor deprived of its properties. Rosenbach discovered another micro-organism in pus which he called staphylococcus pyogenes albus, and Passet another which he called staphylococcus pyogenes citreus.

That micro-organisms can and do cause wound diseases has been fully demonstrated. How they do this is a question not fully settled.

The present theory briefly stated is that this results from an unlimited increase in a mechanical way or through stoppage of capillaries, through solution of albumen or by chemical action. Physiology teaches us, however, that mechanical and chemical agents do not act directly on the body. All processes in man as in animals, in health and disease, progress only under the influence of nerves. Local mechanical and chemical agents work only indirectly on the body through the sympathetic nerves, and thus the microbes work harm

* Ibid.

† Ibid.

indirectly by irritating the sympathetic nerves into a diseased state. The presence of bacteria and their means of support in the body effect an irritation which the sympathetic nerves receive, and this owing to the dilation of enervated capillaries leads to afflux of blood to the irritated part. The congestion, the stasis, the altered local diffusion, and nutrient phenomena, are natural consequence of the local irritation, and when this is of long standing, general disturbances of nutrition occur in that body, that is to say, disease.

Accepting this theory, and knowing that other agents will likewise affect the sympathetic nerves, we must admit that inflammation and suppuration may be caused not only by staphylococcus and streptococcus, but by other irritants. In addition to the staphylococcus microbes it has recently been discovered that ptomaines will also cause suppuration. In studying the action of iodoform, to which I shall allude later, this has been fully demonstrated, and these facts explain many of the phenomena that could only be explained partially by the microbe theory, and thus the maxim previously mentioned that all suppuration is due to the presence of micro-organisms, is now somewhat modified. The micro-organisms referred to throw off certain waste products in their growth which are called ptomaines. The same results do not always follow the inoculation of animals or men with the pathogenic bacteria, but the decomposed fluids even when they have been deprived of microbes by filtration or boiling, have a poisonous effect upon the bodies of animals. "Gautier has shown that in the discharges of entirely healthy animals, poisonous alkaloid, like bodies are to be found which are not products of decomposition, and which he called leucomaines. He has found this alkaloid in the saliva, urine, etc., of animals. From the muscle of animals he has obtained five different crystalline alkaloids (leucomaines) which are very acid and acted as poisons on the nerve centres. These leucomaines belong to the ptomaine group, both of which found in animal bodies, now number more than thirty.

Prof. Brieger has isolated many of these ptomaines, one he named *meuridine*, another *cadarerine*, another *putucine*, each name signifying its source. He experimented with the typhoid fever germ allowing it to act upon raw meat. With the poisoning principle obtained from the extract he inoculated rabbits, and guinea pigs, and produced many of the typhoid symptoms.

(To be Concluded.)

British Journal of Dental Science.

LONDON, AUGUST 1st, 1890.

A CURIOUS CASE.

OUR language is rich in many proverbs and dicta which, in different ways, enforce the truth that it is of the very first importance, nay, that it is absolutely essential to think before you act, or, in other words, to look before you leap. It will, we believe, be affirmed by all evenly balanced minds, that the majority of our mistakes and their consequent troubles and perplexities have been due to some lack of forethought ; to absent-mindedness ; to not thinking of a possible mistake, slip, or unguarded action ; and to not guarding against them in a common sense way. Tell a man of one of these accidents, and the thing seems so absurd, the result of so obviously stupid an action, that he will laugh to scorn the possibility, not to say probability, of his ever falling into the same error. Yet the chances are a hundred to one that before many weeks have run, if he does not perpetrate the self-same blunder, he sins in an equally egregious manner in another direction. Happily it is usually possible to gloss over or repair these mistakes, to bury them deeply in oblivion, and to wear a garb of calm superiority should a brother in distress confide his tale to us. But ever and anon, as if to bolster up that skaky proverb, "Truth will out," (shaky, at any rate, in a worldly sense), the blunder is brought to light by its consequences, it becomes the talk of the town, bringing ruin to a man, who, if no better, is at least no worse than the majority of his fellow-men. Such a case is to hand in the current

number of the "Journal für Zahnheilkunde,"—a mistake so culpable, that even though our conscience may prick us slightly, we yet cannot help wondering how any man could possibly have so erred. In September of last year, a young lady came under the hands of a Dental Mechanic for some artificial teeth. When these were introduced into the mouth, it was evident that they did not fit; so, to soften the vulcanite, the mechanic warmed it over the flame of a spirit lamp, and then pressed the plate into the mouth of the patient, whilst still hot. Consequently, a white mark was left on the gum wherever the plate rested, due to the burning of the mucous membrane, and the patient suffered great pain. At last, the mechanic seems to have recognized that the plate would not fit, and made a new one. This fitted no better, so he repeated his experiments with the spirit lamp, and as a result produced such an acute inflammation, even suppuration of the upper jaw, that he was obliged to send the patient to a medical man, who, under an anæsthetic performed an operation—what, is not stated. The patient was not convalescent for some weeks. When brought into Court the plaintiff urged that the whole trouble was due to the forcible introduction of the hot vulcanite plate. The accused, however, affirmed that the jaw was already inflamed when he first saw the patient, and, moreover, he had stated, that before putting in the plate, it was essential that the roots present should be extracted, but that the lady had refused. The expert, before whom the case was tried, held it to be probable that there was some slight inflammation at the time of the first visit, but that by so much the less should the accused have adopted the procedure which he did. The plaintiff placed her damages at a hundred marks, but the Court only awarded her fifty, though it imposed a fine of a hundred. What a curious collection of facts is here! A lady who does not follow the advice of a man to whom she goes for advice.—A mechanic, who to escape one horn of the dilemma impales himself on the other. To prove his stupid methods were not the cause of the lady's trouble, admits that, though he told the patient it was malpractice not to extract

the roots before putting in the plate, yet he immediately stultified his advice and his convictions by doing what he just said should not be done. A Court who thinks £5 too much compensation for weeks of trouble, and awards £2 10s., though in the same breath it fines the accused £5, to enrich the State, who was only appealed to as an arbitrator. Poor Prince of Denmark, you were not far wrong in saying "The time is out of joint."

OUR daily papers supply many wants, but if the following is all they can manage in answer to a question in dentistry, hadn't they better leave it alone?

"There should be no question about removing sound eye-teeth (more correctly canine); if they are decayed, certainly have them extracted, no good dentist would advise any other course; leaving in stumps under any circumstances is sure to ultimately produce trouble, suffering, and expense, whereas once removed all this is obviated once for all. By all means have whatever are required extracted under nitrous oxide gas."

Observe the correction, "more correctly canine." "Decayed? take it out." Its the old story. Good and bad are, we know, relative terms, but if the above is the advice of a "good dentist" where on earth shall we find the bad. It almost reads as if an "anæsthetist" had done this.

A CURIOUS case was reported by Dr. Mayer at the May Meeting of the Medico-chirurgical Society of Montreal. It was that of a woman, aged 31, who, soon after her arrival in Canada from England, suffered from nasal obstruction. On examination, the right nostril was seen to be occluded by swelling of the mucous membrane and the turbinated bones. When, however, a probe was passed for exploratory purposes, a foreign body of large proportions was encountered. Cocaine was applied, and after some difficulty, a rhinolith was dislodged and drawn out of the nostril. It measured about three-quarters of an inch by half an inch in length, and weighed about 38 grains. The patient remembered

that, when 6 years old, she had introduced a number of small sea-shells into the nostril, but always believed that they had all been removed. The patient's husband, who had been acquainted with her from infancy, authenticated the incident about the shells. The rhinolith was crushed, and then fragments of a pearly nature were easily distinguished. Thus a foreign body had occupied the nasal cavity for twenty-five years without causing symptoms.

IT seems that a correspondent of our "Lively Evening Paper" happened to meet a medical student who had repaired to a popular music hall to celebrate his passing the finals by getting drunk and making a noise. A long amusing column of chit-chat is the result. We cannot, of course, give it all, but the following paragraph is amusing.

"You see, when you go up for your clinical they get a lot of cases out of the hospitals—the hardest cases they can think of, and they get 'em there, lying in bed, and try all they can to fog you over there. Well, suppose a chap's at Guy's; he's very likely seen one or two of the cases he's examined about every day in the hospital. Or very likely he's heard about 'em. Why, one chap was being taken in his clinical by old Duckworth—Sir Dyce Duckworth—you know him; and the first case he's taken to he looks at the chap's face and he knows him in a minute. He'd seen the case every day for weeks, and knew a dashed sight more about him than old Duckworth did. So he just reels it off like a book, and every question Sir Dyce puts he answers him. So Sir Dyce takes him on to another case in another bed. And as soon as he saw the case he recognised this one just the same. He'd got it all off by heart, and old Duckworth couldn't fog him any road. So they go on to another bed, and when the chap looked he thought he was done sure, for it was some strange case they'd got in, and he couldn't make head nor tail of it anyhow. He could see old Duckworth meant doing him this time, so he tries a game on. When Sir Dyce says, 'Well, what's the matter with him?' the chap don't cave in. Not

he! He says, as bold as a lion, 'I feel bound to tell you, Sir Dyce.' 'Well?' says Sir Dyce. 'I feel bound to tell you that I've seen that case in hospital!' When he said that it fairly knocked old Sir Dyce off his perch. He says, 'That's very honest, very honest, very honest'; and goes and signs him through in the first division."

There's many a true word spoken in jest.

NOT a few grumbles were heard over the question, "Describe the post-mortem signs in a case of drowning as distinguished from a case of ordinary suffocation." This student's answer had the merit of brevity. "In the case of drowning the body would be wet." It may be well to report that the student *passed*.

WE are glad to learn that the initiative of Messrs. Fletcher and Quimby in presenting prizes to the Dental Schools of Manchester and Liverpool, has induced Mr. James Wallace to make a similar offer, viz, an annual prize of £20 for five years, to the Glasgow School, for proficiency in the practical part of the profession.

AT the quarterly Council of the College of Surgeons, Mr. J. B. Sutton was appointed Erasmus Wilson Lecturer for the ensuing year. Mr. Thomas Bryant was elected President and Mr. T. Smith and Sir William Mac Cormac Vice-Presidents. Mr. A. W. Barrett was elected a member of the Dental Section of the Board of Examiners in Dental Surgery.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Dental Examination. The following gentlemen having passed the necessary examination have been admitted Licentiates in Dental Surgery of the College. Mr. Thomas Quinlan, Cardiff, and Mr. Henry Pedler, Belfast. The next examination is fixed to take place on Monday October 27th.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

DR. ROBERT RICHTER'S GLASS-FILLING MATERIALS.

MR. E. Simonis of Berlin sends us a sample of these materials packed in a box, with tweezers, spatula, &c., for manipulating them. The materials consists of various shades of powdered glass, by mixing and fusing which, the exact tone and character of the tooth substance can be obtained. Having prepared the cavity, say a hole with walls on all sides in the labial surface of a central, a little cup, the exact shape of the cavity, is made by pressing in a thin piece of platinum foil or of Williams, Gold-platinum Foil, No. 60. This must be carefully pressed in contact with walls, by means of little pellets of cotton-wool. Having got the cup to fit, the superfluous foil is bent over the edge of the cavity on to the surface of the tooth, so as to form a rim, by which the cup is held in subsequent stages of the work. The colour of the tooth is now obtained by blending the various powders, this is then mixed with distilled water to about the consistency of cream. The cup is filled level with the rim, the superfluous moisture dried off with blotting paper and the mass then fused in the flame of a spirit lamp. If need be the mass is again fused till an even surface is obtained, and to facilitate matters the cup can be inverted over the flame without any fear of the mass falling out. It may be as well to point out that small fissures and cracks in the cup, due to the splitting of the foil, whilst it is being pressed into place, do not appear to be of any consequence. Undercuts are now made in the cavity, with a little liquid Oxyphosphate filling. If any grinding is required it can be done the following day, this will destroy the polish of the segment, and will necessitate fusing again in order to restore

it. There are certain difficulties in making the cup, and those commencing had better select broad shallow cavities. The foil seems almost always to give in deep sharp edged cavities, and it is possible these could be more easily treated by taking a little impression of them in Stent and casting this in plaster and pumice. There are other minor points space will not allow us to touch upon, but we will put in a few words our impressions of its value as a filling process. We hardly like to attempt to speak authoritatively on such a short acquaintance. In the first place the appearance leaves nothing to be desired and in cavities easily get-at-able and in prominent positions we believe this filling will have a large future. Its durability will depend on the layer of Oxyphosphate fixing it in place. This however should be but a very fine line, and so should be fairly durable. But at the worst, it will be at least as durable as an ordinary Oxyphosphate filling, so that none need be deterred trying it on this ground. As a matter of fact we hear Dr. Richter has some inlays which have been inserted three years and are now quite intact. On the whole we strongly advise all to try it, but to do so on teeth out of the mouth before attempting to fill those in. It is especially indicated in labial cavities of the six anterior teeth.

Reports of Societies.

THE MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly meeting of this Society took place at the Grand Hotel on May 6th; Mr. Headridge, President, in the chair.

VOTE of CONDOLENCE.—The President said it was with deep regret that he rose to communicate the sad intelligence of the death of the wife of Dr. Parsons Shaw, which had taken place only the day before. He was sure their feelings would go out to him in his great bereavement. Mr. Simms, the Hon. Secretary, then proposed the following resolution.—That the members of this Society beg to express their deep sympathy with Dr. Parsons Shaw in the loss which has befallen him in the death of his wife.

Mr. P. HEADRIDGE, who said he had known Dr. Shaw for a great number of years, in some appropriate and feeling remarks, supported the resolution, which was carried unanimously, and the Secretary was instructed to forward the same to Dr. Shaw.

CASUAL COMMUNICATIONS.

Mr. DRESCHFELD exhibited a tooth in which he had inserted a diamond.

Mr. Smithard said he had an improvement to show in the operating stool which he brought out some years since. He had altered the top, and had replaced the iron stem with a brass one, by which means the weight was reduced to only eighteen pounds, which made it now the lightest in the market. It was self righting, and adapted itself to every movement of the operator. The seat was in the form of a saddle, which was a great advantage in long operations, and was placed on a specially formed spring which gave it great elasticity in all directions. It had a range of ten inches in height, and required no special lever for operating, as in the ordinary form of stool.

Mr. COLLETT said he had used the stool for the past week, and found it of great use.

DISCUSSION.

Mr. G. G. CAMPION said that, in regard to the operation of torsion performed by Mr. Linnell whereby several laterals had been twisted with the forceps, every case had been carefully examined by means of Mr. Broughton's electric light, and there was no evidence whatever that the pulps had in any way suffered. That was, to his mind, a very interesting fact; because it was held by many men that, although it was possible to perform the operation of torsion upon centrals with success, it was not applicable to laterals on account of their flattened roots. It was held that if they twisted a lateral they must elongate it a little, as well as rupture the bloodvessels; but Mr. Linnell had shown that the twisting of these teeth was an operation that could be successfully performed. It would require, however, a number of observations to show if it would be successful in all cases, or whether the pulps in these teeth would be more liable to perish than in central teeth. As to the method of fitting the Logan Crowns which Mr. Dougan had shown, he (Mr. Campion) thought it an improvement on the ordinary method, inasmuch as he

did not use the reamers usually employed, but made his holes in the roots with a long fissure burr, with which he was able to make these of the same shape in section as the post, thereby saving a great deal of the root and making it stronger.

Mr. HOOTON said that, in regard to Mr. Linnell's cases, he was agreeably surprised to find that the operation of torsion of the laterals was practically possible. He himself should have gone about the matter in a much more deliberate way by means of a wedge. From the result of Mr. Linnell's success in not destroying the pulps he thought the operation was possible in all ordinary cases. He also thought the steel burr used by Mr. Dougan was a great advantage. But it shaped the root in such an expeditious a manner that one would like to know if any irritation was set up. He would like to have some information as to the durability of the Logan crown.

Mr. SIMMS said that, from his experience of the Logan crown, the source of weakness was not in the crown itself but in the medium used in fastening it to the natural root. He had used white cement for some time past, and the only failure he had was where the stopping was not properly secured, in which case the tooth came out. He had used copper amalgam in two cases, and so far both had been successful.

Mr. DUNKERLEY said that at the demonstration given by Mr. Simms on "Continuous Gum Work" he (Mr. Dunkerley) had shown several cases which had been executed by Dr. Shaw and himself over twenty, and some quite thirty years ago, and the work was done in one of the old fashioned coke furnaces. The principle thing to observe in this kind of work was ; first, to get the gum body of the proper consistency, second, to dry the work well ; and, lastly, not to overbake it. If the latter event took place it made the material very brittle, which necessitated the retouching up and rebaking of the body before applying the gum. If this was not done, air was retained, and cracks were sure to follow. In the specimen exhibited by Mr. Houghton, they had apparently a continuous gum body without cracks, and the question was whether it would crack in making up or in use. Before baking it was of the utmost importance that the work was dry, and he doubted if it would last if done too quickly. He (Mr. Dunkerley) thought the Allen gum body was the best.

Mr. HOUGHTON (the demonstrator in continuous gum work at the last meeting) said he had made about a dozen pieces of this work, and so far there had been no accidents. He did

not think it mattered much how fast the work was done if the body was well dried.

MR. P. HEADRIDGE said that so far as he was concerned, he preferred the Bonwell to the Logan crown on account of its greater adaptability. He was also prepared to use White's cement in place of amalgam, and he quite understood Mr. Simms to say that the amalgam would not adapt itself round the pivot. One of his objections to the Logan crown was that the pin was always in the way, a defect which was absent in the Bonwell crown. He thought it preferable to have the crown fixed on the pin than to have the pin in the crown. Speaking of the continuous gum, he said that Mr. Houghton had a very thick body in his work which prevented its cracking. The great secret of successful work, however, was to keep the body just under the fusing point in order to prevent its becoming brittle. His experience had taught him it was best to fire the body quickly, but it was of the utmost importance that the body be first thoroughly dried. The present furnaces were better than the old ones. In the latter they had to get up a great heat, and if they were not very dexterous in taking the work out of the oven they would often have an accident.

MR. DOUGAN said he had used the Logan crowns about eighteen months, and none of them had become loose ; but two other crowns set in a similar way had become loose. He reset one and it had remained firm ever since. The second was put in with cement, which appeared to have worked loose through having been used too soon. He reinserted it and it still remained firm. As to the durability of the Logan crown he could not say. It was a cheap crown, and could be readily fixed. He had very little confidence in the durability of white cement. He did not believe in Bonwell's crowns. He had used them and found them troublesome to fix.

THE PROPOSED LIBRARY.

The President said he wished to make a communication to the members of great importance. They were about to form a library in connection with the Society, and he had not the slightest doubt that some members had a number of books which they would be able and willing to give as a nucleus for this proposed library that would prove very acceptable, and he would be very glad indeed to hear from any gentleman who had any rare dental works which they were willing to hand over to the library committee.

They were ambitious of having the best library in the country and it depended on themselves whether they were to attain that object or not.

The proceedings then terminated with a vote of thanks to those gentlemen who had given the practical demonstrations, at the previous meeting.

Dental News.

WE notice the death of William Kitchen Parker, formerly Hunterian Professor of Comparative Anatomy at the Royal College of Surgeons, which took place at the house of his son Professor Parker, of the South Wales University College, Cardiff. In early life Mr. Parker was a chemist's assistant, and it is recorded, that while engaged in business in that capacity from seven in the morning until ten at night, it was his practice to rise several hours before his morning work began to collect botanical specimens. After coming to London he became assistant to Professor Todd at King's College, and qualified for medical practice in 1849. His first work as an anatomist, published in 1857, related to the Foraminifera, and it was followed up by a long series of memoirs of first-class importance relating to the morphology of the skull and other anatomical subjects.

ON Tuesday, July 15th, the Countess of Rosebery distributed the prizes to the students of the Association for the Oral Instruction of the Deaf and Dumb. Earl Granville presided, and, a satisfactory report having been presented, some interesting illustrations of the method of teaching deaf mutes to speak were given, under the direction of Mr. Van Praagh, the students pronouncing with wonderful distinctness difficult words and sentences. An address was given by a youth of 16, and a young lady of the same age recited a verse of the National Anthem with great distinctness.

EDINBURGH DENTAL HOSPITAL.—The half-yearly meeting in connection with the Edinburgh Dental Hospital and School took place in the Hospital, 5 Lauriston Lane, on the 22nd ult. —Professor Sir William Turner presiding. Mr. Bowman Macleod, the Dean of the Hospital, submitted his half-yearly

report, which stated that during the past half-year the number of students had not only been maintained, but had steadily increased. The conservative side of the work of the school had been developed very much during the last six months, the number of teeth stopped being far in excess of any previous session. The number of operations performed during the six months ending 30th June was 4215, of which 2097 were stoppings, 1936 ordinary extractions, 150 anæsthetic cases, 20 class cases, and thirty miscellaneous cases. Mr. Macleod remarked that the great increase in stopping was a noteworthy fact, because it showed that the public were more and more coming to recognize that teeth were not only worth having, but were worth retaining. Sir William Turner then presented the chief prizes as follows:—Senior medal for general excellence in hospital practice, Mr. James T. Jameson; junior medals for general excellence, Mr. G. Bonnalie and Mr. H. Perkins; in the systematic courses—dental anatomy and physiology, Mr. John William Daniels; dental surgery and pathology, Mr. John Cromar; and dental mechanics, Mr. John William Daniels. It was mentioned that the senior medal had been awarded to Mr. Jameson, after a close competition with Mr. Murray Thomson. In presenting these awards, Sir William Turner, as a member of the General Medical Council, expressed gratification at the progress which had taken place in dentistry of recent years—a progress which, he said, had been effected by a desire not only to improve its status, but also its education and its means of doing good.

On Wednesday the 23rd ult. the Dental Hospital of London held its annual *Conversazione*, when the prizes were distributed to the successful Students by Mr. Thomas Underwood. Needless to say that a large number of the Staff, Students (past and present) visitors and lady friends thronged the rooms of the Stanley Exhibition in which the gathering was held. This seems to be becoming quite the Dental reunion of the year, the whole evening being spent in greeting friends and renewing acquaintanceships.

The following is the list of Prize winners:—

Saunders Scholars—Mr. T. Coysh; Mr. A. C. Gask; Mr. W. May.

Ash's Prize (*Given by Messrs. Ash & Sons*)—Mr. E. R. Bull.

2nd Prize (*Given by the School*)—Mr. W. May.
Certificate.—Mr. A. C. Gask.

Class Prizes, Winter Session, 1889-90.

Mechanical Dentistry :

1st Prize—Mr. T. Coysh ; Mr. C. Schelling.
Certificates—Mr. W. May ; Mr. C. F. Badcock ; Mr. E.

R. Bull.

Metallurgy :

1st Prize—Mr. A. C. Gask.
2nd Prize—Mr. C. Schelling.
Certificates—Mr. C. F. Badcock ; Mr. E. R. Bull.

Prize in Operative Dental Surgery.

1st Prize—Mr. W. May.
2nd Prize—Mr. E. H. L. Briault.
Certificates—Mr. C. Schelling ; Mr. M. Woolf.

Class Prizes, Summer Session, 1890.

Dental Surgery :

1st Prize—Mr. T. Coysh ; Mr. A. C. Gask.
Certificates—Mr. W. May ; Mr. E. R. Bull ; Mr. C. J. Allin ; Mr. L. C. Tomlyn ; Mr. C. F. Badcock.

Dental Anatomy :

1st Prize—Mr. W. May.
2nd Prize—Mr. T. Coysh.
Certificates—Mr. E. R. Bull ; Mr. C. F. Badcock.
Students' Society Prize—Mr. M. Woolf.

The various gentlemen were introduced to Mr Underwood by the Dean, Mr. Morton Smale, and greeted by their fellow students and friends with loud cheers. At the conclusion of this ceremony Mr. Thomas Underwood delivered an admirable address, which we are compelled to hold over till our next issue. In a few words, Mr. Smith Turner, thanked Mr. Underwood for so kindly officiating, his remarks being heartily endorsed by cheers. The remainder of a most enjoyable evening was spent talking to friends, regaling oneself at the excellent refreshments, or listening to that excellent "Ladies' Orchestra" conducted by Miss Francis Graves which, assisted by Mr. Edmund Woodhouse, delighted those present.

INTERNATIONAL MEDICAL CONGRESS, BERLIN.

THE Congress will be opened by a general meeting, in the Circus Renz, Karlstrasse, at 11 A.M. on Monday, August 4th. The general meetings on Wednesday and Saturday will be held at the same place. The meeting rooms of all the Sections will be in the National Exhibition buildings in Alt Moabitstrasse.

PROGRAMME.

Saturday, August 2nd.

Opening of the Medico Scientific Exhibition in the National Exhibition buildings, Alt Moabitstrasse.

Monday, August 4th.

11 A.M.—Opening of the Congress in the Circus Renz, Karlstrasse.

4 P.M.—Constitution of the Sections in the sectional meeting rooms in the National Exhibition Park, Alt Moabitstrasse.

9 P.M.—Social reunion of members and ladies in the Exhibition Park.

Tuesday, August 5th.

8 A.M., 5 P.M.—Sectional meetings.

8 P.M.—Reception of members in the Rathhaus by the Municipality of Berlin.

Wednesday, August 6th.

11 A.M.—General meeting, Circus Renz.

3 to 5 P.M.—Sectional meetings.

7 P.M.—Sectional dinners, to some of which ladies may be invited.

Thursday, August 7th.

8 A.M., 5 P.M.—Sectional meetings.

9 P.M.—Ball.

Friday, August 8th.

8 A.M., 5 P.M.—Sectional meetings.

Afternoon.—Court reception at the New Palace at Potsdam by special invitation.

Saturday, August 9th.

8 to 11 A.M.—Sectional meetings.

12 noon.—Final general meeting.

8 P.M.—Farewell dinner to members of the Congress given by members of the profession in Berlin, in Krolls Garden, in the Königs Platz.

Membership Tickets, etc.—Membership tickets authorise

attendance at all the scientific meetings and to the museum. For all the other meetings special tickets must be obtained at the Central Bureau of the Congress. After August 4th the Central Bureau will be located in the Austellungs Park, N.W. Alt Moabit. Until then letters for the General Secretary, Exhibition and Lodgings Committees are to be sent to Karlstrasse 19 ; for the Treasurer to Leipzigerstrasse 75. Telegrams and letters to members during the meeting of the Congress should be addressed : Berlin N.W., Alt Moabit, No. 4-10, Bureau des Congresses.

The full general programme is now ready, and can be obtained on application to the General Secretary, Karlstrasse 19, Berlin, N.W.

Arrangements for Ladies.—Lady relations of members must send their visiting cards in making application. A committee formed by the wives of Berlin medical men will care for the convenience of all lady visitors. Members of the committee will wear a special badge.

General Addresses—The general addresses will be :

1. Sir Joseph Lester, Bart. : The Present Position of Antiseptic Surgery.
2. Dr. Robert Koch : Bacteriological Investigation.
3. Dr. Bouchard : The Mechanism of Infection and Immunity.
4. Dr. Axel Key : The Relation of the Development of Puberty to Diseases of School Life.
5. Dr. H. Wood : On Anæsthesia.
6. Dr. Cantani : On Antipyretics.
7. Professor Meynert : The co-operation of the Parts of the Brain.
8. Professor Stokvis : On Colonial Pathology.

Papers.—The following English members will read papers, etc.:—Sir W. Turner, Professor Cunningham, Professor Schäfer, Dr. Mott, Dr. F. Semon, Professor Horsley, Dr. Sherrington, Professor Ballance, Sir Henry Acland, Dr. Lauder Brunton, Professor Grainger Stewart, Dr. Herman Weber, Sir Andrew Clark, Dr. Pavy, Dr. Ord, Dr. Dreshfield, Dr. P. Kidd, Professor Greenfield, Dr. S. A. Eccles, Dr. H. Ashby, Mr. Jonathan Hutchinson, Mr. Muirhead Little, Professor Macewen, Dr. Galabin, Dr. J. Williams, Dr. Macan, Dr. T. Keith, Dr. Lloyd Roberts, Dr. Moore Madden, Dr. Stuart Nairne, Dr. James Murphy, Professor Simpson, Dr. W. T. Sinclair, Dr. R. Bell, Dr. T. Buzzard, Dr. C. Beever, Mr. H. W. Page, Dr. James Ross, Dr. W. A. Brailey,

Dr. K. Grossmann, Dr. O. M. Berry, Dr. James Stewart, Dr. D. Newman, Dr. M. Morris, Dr. Colcott Fox, Dr. Brooke, Dr. Mapother, Dr. Sinclair, Dr. P. S. Abraham, Dr. Green, Mr. Startin, Mr. Mummary, Mr. Hayman, Mr. G. Brunton, Mr. T. G. Read, Mr. A. W. W. Baker, Mr. G. Cunningham, Mr. Hutchinson, Dr. Drysdale, Dr. Beaven Rake, Dr. G. Buchanan, and others.

THE SELECT COMMITTEE ON HOSPITALS.

At the Fifteenth meeting, Mr. C. Q. Roberts (the Secretary of the London Hospital), said that no probationer nor sister had been dismissed whilst he had been the secretary of the institution. Some of the standing orders with respect to the nurses and chaplain had been altered at a specially summoned general court of governors. The matron was appointed according to the by-laws made by the house committee. She had to maintain a staff of well-trained nurses, and be responsible for the careful training of the probabationers by the sisters, to hold special instruction classes for the probationers, and to arrange for their class examination. The matron now had, with the approval of the committee, power to dismiss probationers. The witness read some reports of the house visitors, which he said proved that in every way the food supplied to the nurses, as well as to the hospital patients, was excellent.

Miss Eva Luckes (Matron of the London Hospital), stated that she had been matron for the past ten years, and had four years' previous hospital experience at Westminster, in children's and other hospitals. Her duties included the sole control and superintendence of all the nurses and everything connected with them in and out of the wards. She was also responsible for the cleanliness and general condition of the wards. Frequently she went round the wards to see that all was right. It would be the duty of the sister to report to her the illness of any of the nurses, although, of course, to any one going over the wards, serious illness would be noticeable. The witness was directly responsible to the house committee, and if anything wanted altering with regard to the nurses, she would consult the house governor. Any complaints she received from nurses, she would first investigate, and then report them to the house governor or

committee. In regard to the food, there had been a great improvement since she had been the matron. With reference to the alleged insufficiency of nurses, she stated that the nursing staff was sufficient for the work. The statement that unqualified nurses were in charge of serious cases she considered quite unfounded. Previous witnesses were incorrect in certain essential particulars.

At the Sixteenth meeting, Miss Luckes said she had absolutely no knowledge of the overcrowding of the wards of Sir Andrew Clark, and of patients being wheeled out so that Sir Andrew should not find out that it was overcrowded. No nurse would venture to remove a patient from a ward without the authority of the house-physician. Supposing there was overcrowding she would have heard of it. A patient would never be left in charge of an inexperienced nurse. She made complaints as to the feeding of nurses in 1882. That was followed by the appointment of a sub-committee to inquire into the whole matter. The result was a gradual and great improvement. It was quite against the rules that the patients should be disturbed early in the morning. Probationers were sometimes sent out to private patients as trained nurses. She had never had any complaint from the medical attendants of the cases of the nurses sent out from the hospital; no complaint of want of skill, although there were sometimes little questions as to whether they had sufficient tact or discretion. She had never refused leave to anyone to go to a dying relative, nor had she ever delayed them even. The drains had given a great deal of anxiety from time to time. The specific complaint of Miss Yatman as to the sewer gas was, on investigation, found to be nothing but ordinary coal gas. The Witness continued that she had no pecuniary interest in the victualling of the nurses. The house governor was the head official so far as the food supply was concerned. As to the nursing staff of the hospital; the figures were—1 matron, 4 matron's assistants, 23 sisters, 34 staff nurses, 52 probationers in the second year, 82 probationers in the first year, 14 paying probationers, 9 institute nurses, 25 private nursing staff, making a total of 243 hospital and private staff. For the actual hospital work there were 218 members of the nursing staff, and 22 ward-maids who were non-resident. The nursing staff had to do other work than nursing, but the additional work did not entail any neglect or suffering to the patients. No difference as to the housemaid's work was made between the paying and non-paying proba-

tioners. The nurses made their own and the patients' beds. She considered 218 nurses sufficient for the requirements of the hospital. That was $3\frac{1}{2}$ patients to each nurse. If the housemaid's work of the nurses were lighter, it would be easier for the nurses, but she did not think it would be any better for the patients. In October, 1888, there was an unfortunate infectious outbreak among the nursing staff, originating, she believed from infection by patients. The wards were closed, cleaned, and disinfected. This outbreak was quite unparalleled in the history of the hospital. The nurses who go out do not participate in the profits. The hospital has an arrangement with the National Pension Fund for providing the nurses with pensions by paying half of their annual premiums while they remain in the service of the hospital. The wages of the nurses were practically increased by the premium paid for them. It was considered the most liberal arrangement to be obtained at any hospital. She did not think that the nurses overworked; under the circumstances the work is done. If in good health, she did not think they will suffer at all. If economy were no object she should be glad to see nurses better paid and with fewer hours of work. she should not think it a waste of public money, but money well spent. As compared with the condition of the nurses at other hospitals she could not honestly recommend the governors of the London Hospitals that it was their duty to spend more money for the relief of their nurses. She read letters from several of the nurses mentioned in the evidence of Miss Yatman as having complained to her of their treatment. The effect of the letters was to contradict some of Miss Yatman's evidence.

At the Seventeenth meeting, Mr. F. C. Carr-Gomm, L.C.C. stated that from December, 1885 to December, 1889, he was Chairman of the House Committee of the London Hospital. He had had no experience of any other charitable institution. He frequently visited the wards, and was able to see that the work was properly carried on. Some years ago there were complaints as to the food supplied to the nurses and sisters, but not recently. In that year the Board had trouble with one of the contractors, whose supply of food was not at all satisfactory. The contractors were changed. A careful reorganisation of the system of feeding the nursing staff was carried out. The matron really dismissed the nurses, and reported to the House Committee. Of course the committee had authority to appoint, but they had never done so to his know

ledge. The committee had inquired into some cases of dismissal, with the result that they had always confirmed the decision of the matron. He said Sir Edmund Currie had drawn attention to the case of Probationer Page and that resulted in an inquiry being made. There was no sub-committee to deal with questions affecting the nurses. If appealed to, the House Committee would have gone into any matters of complaint on the part of probationers. After the allegations made here, they are still satisfied with their system of inquiry as regards probationers. It is a fact that only the matron's side of the case is heard, unless the probationer wished to be heard. He did not think that the house committee were in the dark as to what was going on in regard to the treatment of the nursing staff. He did not see how they could have a register book for complaints to be laid before the committee. With reference to the official staff the witness said that the house governor, Mr. Nixon, received £900 a year besides a house; the secretary received £400 a year; the matron £250 a year with board and lodging; and the chaplain's salary was 250 a year.

Review.

Dental Surgery for Medical Practitioners and Students of Medicine. By A. W. Barrett, M.B. (Lond.) M.R.C.S., L.D.S.E.

This little work of 136 pages, one of Lewis's "Practical Series," in twelve short chapters, treats of the first and second dentitions, the teeth generally, their abnormalities and irregularities, the injuries and diseases to which they are liable, and the methods for their extraction and replacement, together with a few words on anæsthetics.

Although avowedly written for the use of "Medical Practitioners and Students of Medicine," it is chiefly remarkable for its exceedingly superficial treatment of all those subjects which most concern them.

To the means of distinguishing temporary from permanent teeth, often a difficult matter even for a dentist, but half a page is devoted, and the prominent cingulum, that most characteristic mark of the milk dentition, is entirely ignored.

Hæmorrhage after extraction is disposed of in an equally short space, no mention being made of the aids to its arrest in severe cases afforded by cold to the part, rest in the re-

cumbent position, light unstimulating diet and styptics given internally, neither is it referred to in the index. "Alveolar abscess" is only to be found under the heading "Acute Periodontitis," and among the directions for its treatment, scattered through chapters v. and vi., we discover no warning against that pernicious and very prevalent practice of poulticing the face, even in a paragraph on "Fistulous Opening through the Cheek," which is its result in nine cases out of ten.

We are told, too, that the only remedies for its relief are extraction of the offending tooth opening the pulp cavity. Has the author never evacuated an abscess with the knife to the immediate comfort of the patient and the ultimate salvation of the tooth?

In the chapter on "Toothache" we look in vain for some notice of the excellent results, which are so often attained by the administration of a brisk aperient, especially in the case of women and children, of the local application of counter-irritants in cases of periostitis. In fact, with the solitary exception of a case of neuralgia which is instanced as having been cured by the administration of iron and arsenic, there is no mention of medical treatment in dental caries throughout the book; yet, surely, the good that may be effected by the use of drugs is not a wholly unimportant point to the medicine man. Chloroform is advised by Mr. Barrett, as the anæsthetic to be chosen in an hysterical case, male and female, with no special cardiac irregularity, but he omits to mention that on no account should it ever be given in any other than the recumbent position, which is the most inconvenient for the operator.

Chapter X. and XII. on "The Wearing of Artificial Teeth" and "The Extraction of Teeth" respectively, are quite the best in the book, notwithstanding the fact that, in the latter, the surgeon is twice told to extract upper bicuspid by torsion, an impossible proceeding, which, if attempted, would probably be fraught with dire results.

The illustrations are good, and the type and paper leave nothing to be desired, but the style of the whole work is suggestive rather of the popular and not too accurate treatise, than the practical text-book on which to rely in case of need.

ANSWER TO CORRESPONDENT.

Mr. ARTHUR MOORE.—You should apply to the College of Preceptors, Bloomsbury Square, W.C., or to the Apothecaries' Hall, Blackfriars, E.C., or the Examination Hall, Embankment, for the papers you require. The Pharmaceutical Prelim. is not accepted, nor do we think this certificate will excuse you being re-examined in these subjects.—EDITOR.

British Journal of Dental Science.

No. 542. LONDON, AUG. 15, 1890. VOL. XXXIII.

ALVEOLAR ABSCESS.*

By HENRY L. ALBERT, M.R.C.S., L.D.S.,
Dental Surgeon and Lecturer on Dental Surgery to the
Institution.

Gentlemen,—It is a matter of ordinary observation, that civilization has had the most disastrous effects upon the teeth. It has not only impaired their quality, but has even succeeded in actually reducing their number. The softer character of modern teeth, as compared with ancient ones, combined with the overcrowding, so prevalent amongst the civilized, makes them less able to withstand the onslaught of any morbid process, and hence frequency of the disease called, or rather miscalled, "Caries." I say miscalled, for the reason that caries is, in the teeth, necessarily devoid of any vascular change.

Of the results of decayed teeth none is so common as alveolar abscess, and I trust this fact will be sufficient justification for bringing before you a subject that appertains more closely to dental than general surgery.

The usual history of a case of alveolar abscess, excepting that from traumatism, is this. At some time or other the patient had an attack of toothache, which passed away after a short while only to return after a ranging interval, with increased severity, and speedily followed by symptoms of inflammation of the membrane lining the tooth socket, the alveolar-dental periosteum, so called in contra-distinction to the periosteum of the bone itself. The terms are of course purely arbitrary, as one runs into the other without any line of demarcation. In this stage you will find localised pain of

* A Clinical Lecture delivered at St. George's Hospital.

a dull aching character, with tenderness on pressing the face over the affected root. Considerable discomfort, or even pain in biting will be experienced, owing to the tooth having been pushed out of its socket to a certain extent by the inflammatory condition at its fang, and thus coming in contact with the opposing tooth before the closure of the others. Curiously enough, though the act of biting at first causes so much pain, if continued it will give great relief; the explanation being that the pressure exercised is sufficient to drive the tooth into its normal position, and drive the blood out of the swollen periosteum, thereby lessening the tension. The tooth will be sensitive to extremes of temperature, and tender on percussion. The gum, mainly on the labial or buccal aspect, will be heightened in colour.

The advent of suppuration is frequently marked by a rigor, the patient feeling and looking ill; the temperature is raised and the tongue brown and dry; next, swelling to the outer side of the jaw with infiltration into the face and enlargement and tenderness of the sub-maxillary lymphatic glands occur. The character of the pain changes from the dull ache of periosteal inflammation to the throbbing of suppuration, however, when that pathological process is well established the localised dental pain subsides to a great extent from death of the nerve. There is a most characteristic odour to the breath, and the constant inhalation of this combined with the sleepless nights and foodless days. The mouth is opened with difficulty from the infiltration into the muscles or more largely from the reflex contraction of pterygoids, temporals, buccinators, or more especially the masseters. The inflammation may spread back to the floor of the mouth, tongue, palate, or tonsils, or may even burst into the external auditory meatus, or burrow into the muscles of the jaw or neck, giving rise to necrosis, or to sinuses that lead to most unsightly cicatrices; or even pyæmia or death may follow.

This is the history of a case of alveolar abscess that is improperly attended to; the deaths have been few in number, and I believe are mainly the result of pyæmia, but I feel convinced that such a catastrophe might never so happen, much less necrosis or sinuses. Usually the patient places himself under treatment when the face begins to swell.

There is another form of alveolar abscess that is primarily not in any way connected with disease of the teeth, though they soon become implicated. It frequently occurs in the palate and appears with singular rapidity. I have seen one form in

twenty-four hours ; in one patient, a student here, I attributed it to hard work and hospitalism, and in three others constipation has been its precursor. In all these the teeth were sound in the region of the suppuration ; their cause I cannot tell you, but it appears to me but an instance of the close relationship, of the mouth and digestive organs, of which dyspeptic ulcers and furring of the tongue form other illustrations.

The toothache that almost invariably precedes alveolar abscess being due to many causes, of these, exposure of the tooth pulp by caries is undoubtedly the most common, and an exposed pulp means, by reason of pressure from or irritation from the chemical products of decomposing food, or being unprotected from the somewhat erratic variations in temperature of this otherwise happy land, inflammation, and when you remember that the dental nerves are enclosed in such an unyielding structure as dentine you can imagine far better than I can describe the horrible agony of acute inflammation of the pulp. When suppuration occurs, the pus may ooze round the neck of the tooth, and thus give rise to little or no swelling, and this is more likely to take place if the tooth has been previously separated from its bony attachment to an even slight extent such as occurs in elderly people ; but external swelling generally takes place, and varies in position with the tooth affected, thus the upper central incisors are connected with abscesses below the nostrils, the lateral incisors, and these are the teeth most prone to become abscessed, with the infiltration into the upper lips and palate, the canines with suppuration at the inner angle of the eye, and the bicuspid and molars with those of the cheek and temple. These situations are only generally true ; thus there was a child in the Burton Ward quite recently, who had a large palatal abscess connected with an upper first permanent molar. I have never seen necrosis of the palate follow, but elsewhere it is comparatively common.

The lower incisors give rise to suppuration in the chin, floor of the mouth or anterior sub-maxillary region and the bicuspid, 1st and 2nd molars, with abscesses of the posterior sub-maxillary region, pharynx or tonsils. Whilst the wisdom teeth give rise to the largest collections of pus, these being situated about the angle of the jaw. As a rule they point within the mouth, but occasionally on the face, and there are two conditions that determine this—1, abnormally long roots, 2, the reflection of mucous membrane from the cheek to the

gums taking place nearer the free margins of the latter than usual. The first of these is not of importance, as abnormally long tooth-fangs is necessarily accompanied by an abnormally large development of alveolus, and the latter is invariably below the buccal reflection of mucous membrane, hence, supuration will be intra-oral. The second is of greater importance no supuration will be extra-oral, and consequently tend to burst externally. The irregular distribution of the mucous membrane is congenital mostly, but a fertile source is from the union of the mucous membrane of the gum to that of the cheek so often seen as the result of the granulation process by which Nature attempts to cast off necrosed temporary roots in teeth during childhood.

It may be taken as a general rule, that any sinus above a line drawn from the lobe of the ear to the angle of the mouth may be due to the upper teeth, whilst one below that line and above the clavicle may be caused by the lower ones.

It seems there may be two distinct pathological conditions met with in alveolar abscess. In the commonest the illusion of a "circumscribed collection of pus enclosed in a cavity and lined by a membrane, called the pyogenic membrane," is dispelled, for you find nothing more than either a meshwork of lymph enclosing minute collections of pus, or the latter diffused throughout the alveolar. In the other there is a definite limiting membrane, and this form starts as suppuration in those cysts termed by Magitôt, periosteal. Rarefying osteitis in the outer alveolar wall to a limited extent occurs to the carious process is sufficient to establish a communication from the alveolus to the external parts. When arising from sound wisdom teeth, I believe the starting point is acute gingivitis from irritation of the flap of gum that overlaps wisdom teeth, leading on to periostitis. The tooth affected turns black in just the same way as other gangrenous parts, for the nerve and blood-vessels soon succumb to the mechanical strangulation produced by the effused products.

The tendency of these abscesses is to recover in a few days, but sometimes most serious results follow; thus, a child died in this hospital some few years ago, from pyæmia following on alveolar suppuration. At the post mortem examination it was found the whole lower jaw was denuded of its periosteal covering. Occasionally, severe dyspnoea, or even asphyxia occurs. Mr. G. W. Tolloch had such a case, and tracheotomy had to be performed. There are also instances of them opening into the trachea, œsophagus or ear.

I had a case of a child who had two sinuses running through the centre of a large epulis, and on microscopical examination, the tumour was pronounced to be of inflammatory origin, and did, no doubt, arise from periostitis, and it is not at all improbable that myeloid sarcoma may supervene, especially from palatal abscesses, besides which, their rupture into the antrum is comparatively common.

You would think so simple an affection would be out of the pale of mistaken diagnosis, yet a patient was sent up here once who was said to be suffering from carotid aneurism that turned out to be nothing but an alveolar abscess. I have also seen it taken for a gumma of the cheek and sarcoma. The commonest error is confounding it with cellulitis of the face, but the local pain, definite cause, and foul breath are sufficient to avoid this.

As general practitioners, I suppose your only treatment will be to extract the offending tooth, but I would ask you to bear in mind the fact that every tooth taken out aids the production of dyspepsia and its attendant evils. Whether you determine to save the tooth or not, an aperient is always necessary. I believe most cases of toothache and periostitis, and especially that occurring from erupting wisdom teeth, will succumb to purgation alone. When trismus is present, an anæsthetic is generally advisable. The cases for which extraction is indicated, are those in whom much constitutional depression exists.

The principles of the dental treatment are to evacuate the abscess either through the carious cavity generally present or by drilling through the crown, then removing the dead and putrifying nerve and dressing with some antiseptic solution carried by means of cotton wool or other material high up the roots of the tooth; and chronic abscesses of many years' standing can be cured by these means.

Before concluding, I would like to mention an important practical point about poulticing. It is, always direct your patient to hold the poultice inside the mouth. The reason is obvious, for heat and moisture tend to devitalise the soft tissues, and render them prone to "break down," and so suppurate, or in other words, the object of a poultice is to bring the pus to the surface. If it point in the mouth the resultant cicatrix will not be noticeable, and moreover will not interfere with the movements of the jaw, as happened in one case that came under my notice.

ANTISEPTICS IN DENTAL PRACTICE.

By GEO. A. MAXFIELD, D.D.S., Holyoke, Mass.

(Concluded from page 700).

Prof. Miller, of Berlin, says : “ It has long been known that the human mouth was the abode of numerous microscopic organisms, but only within the last five or ten years, since the more exact methods of bacteriological investigation have come into use, have we been able to acquire much definite knowledge as to the morphology, physiology, etc., of their minute organisms. ... There is no part of the human organism which furnished a more universal culture-medium for bacteria than the oral cavity, and the different varieties of micro-organisms that find in it conditions favourable to their development, are correspondingly numerous. Of these, the larger part are of a non-pathogenic character, existing upon the various organic substances in the oral secretions, and upon particles of food which have been allowed to remain between the teeth, but producing no particularly deleterious effect upon the surrounding part, other than decay of the teeth.” Dr. Sudduth also adds :* “ The action of bacteria of the human mouth is by no means confined to dead substances found in the mouth, but a great variety of affections of associate parts as well as more remote parts of the body has been traced to their action. Many years ago Leyden and Jaffe pointed out that bacteria which are found in the mouth, even in a state of perfect health—especially *leptothrix buccalis*—may, under predisposing circumstances, give rise to severe lung diseases. And James Isral, who has given much time to the study of transportation of bacteria from carious teeth, describes a number of cases of abscesses on the neck, chronic pyæmia, etc., which owed their origin to bacteria either swallowed or inhaled from the mouth. ... Chronic or acute disturbances of digestion are also often brought about by the continual swallowing of bacteria lodged in the mouth. Most of the bacteria of the human mouth may pass through the stomach without losing their vitality ; and under certain circumstances may produce severe disturbances, both in the stomach and the intestines. Recent researches have also shewn that pathogenic micro-organisms,

* Sudduth, *Annual of the Universal Medical Sciences*, issue of 1888, Vol. 3, p. 461.

besides such as produce simple local inflammation or suppuration find a favourable culture-medium in the human mouth. Many circumstances point to the conclusion that such pathogenic organisms may exist in the mouth without manifesting themselves in any way different from that of the ordinary saprophytic bacteria, so long as the mucous membrane remains intact. If, however, this becomes reduced in its power, from any cause by resistance, or its integrity is at any place destroyed, then such bacteria may manifest their characteristic action. In this way we can explain the frequent occurrence of extensive suppuration, of abscess, necrosis, even of pyæmia, of diphtheretic and other affections, after extraction; and also the fact that it has proved dangerous to scratch one's finger on a sharp tooth in an unclean mouth." Many experiments by different bacteriologists have demonstrated beyond doubt the presence of the various pathogenic bacteria in the human mouth. "A Frankel mixed the saliva of healthy persons with broth, and allowed the mixture to stand from four to six hours at blood temperature. Many rabbits vaccinated with this mixture died in from 24 to 48 hours, of septicæmia. In some cases he accomplished the same result with saliva. Miller obtained like results by vaccinating mice and rabbits with saliva from the mouth of a woman affected with mycosis tonsillaris benigna. The animals died within thirty hours after vaccination. The micro-organisms were found in great numbers in the tissues and in the blood."*

Black has repeatedly found pus forming bacteria in the human mouth, and in the experiments which he made to ascertain the value of antiseptics—to which I shall allude later—he planted the culture-medium with micro-organisms directly from the human saliva. The present theory in regard to caries of the teeth is so well known to you that I hardly need to state it, yet for completeness I will briefly present it: "Decalcification of the tooth substance is brought about by acids, chiefly lactic, and these acids are principally produced by the action of micro-organisms on carbohydrates. The solution of the decalcified tooth substance is accomplished by the peptonizing power of the same or other micro-organisms."† The facts demonstrating this theory have been so clearly shown by Miller, Black, Allen, Andrews and others, as to be fully established.

* Ibid, p. 463.

† Ibid, p. 462.

The theory of an acid saliva causing caries has now no ground to support it. Micro-organisms are the cause ; that there are indirect, predisposing causes is well known, yet under the most unfavourable conditions caries will not result if the micro-organisms can be kept away. Allen says : " In brief it is lactic acid that does the work, and it is one of the waste products of bacterial life in the presence of a fermentable substance. It is one of the so-called ptomaines. Only a few bacteria eliminate this acid in growing ; but let it be produced and brought into contact with the lime salts of the tooth, chemical action at once takes place. The lactic acid supplanting the phosphoric and carbonic acids of the teeth and forming soluble salts. Fresh supplies of food for the bacteria are constantly obtained from the sugars or amylaceous matters in the mouth, and so each little crack or break in a tooth or other spot difficult of access and hard to keep clean, becomes a focus of destructive activity. ... Were it not for the constant absorption of the acid by the lime salts of the tooth, forming lactate of lime, bacterial life in a cavity would soon cease. They would be smothered in their own waste products and die as naturally as we should, were we compelled to remain in a close room in the presence of the waste products of our own life. ... The acid first formed commences the cavity, and as solution of the lime salts takes place the bacteria follow after, penetrating and enlarging the dentinal tubuli."*

The putrefactive changes in the mouth are also caused by the same micro-organisms that are found in pus, and these micro-organisms are nearly always present in the mouth. Though the theory in regard to the cause of suppuration is somewhat modified, the fact still remains that micro-organisms are the essential factors in the production of a large portion of the suppurative processes.

The presentation of these facts now lead us to consideration of *disinfectants* and *antiseptics*. The difference in the meaning of these two words is well defined by Black thus : " An antiseptic only inhibits the growth of microbes ; a disinfectant destroys them."† The same drug may be used for both purposes, but differently and in different proportions. " Disinfectants are chiefly used in cases where they can be directly applied to some external surface. All organisms on

* Allen, " Etiology of Dental Caries," *International Dental Journal*, March, 1889.

† Black, " Antiseptics," *Cosmos*, April, 1889.

the surface and often those in exudation upon the surface can be destroyed or removed, but it is important to remember that in nearly every diseased surface the organisms are present, not merely in the microscopically diseased surface, but extending into the underlying tissues, which to the naked eye present as yet no pathological change. So far as known the power of penetrating living animal tissues and destroying micro-organisms situated in its meshes, is not possessed by any disinfectant save that of the actual cautery.”*

The physiological meaning of the term, inhibition of the growth of microbes, is as follows: “Suspension of all those secretory or excretory processes which result in the production of ptomaines; and also complete arrest of the multiplication or numerical growth of the micro-organisms. The power to produce the chemical poisons known as ptomaines, to which the morbid processes of septic wounds are due, being destroyed; if in addition they are rendered powerless to increase in numbers, the few septic organisms which first gain access to a wound are as harmless as so many particles of lifeless organic or inorganic matter. So long as they do not functionate they cannot do harm. It should be borne in mind that when micro-organisms are thus rendered temporarily inert, their vitality is steadily diminished by contact with the tissue cell, and the probability is increased that the internecine contest between the tissue-cell and the organism, to which Virchow long ago called attention, will result in victory for the former.”†

The number of antiseptics at our disposal is very large, and new ones are so constantly being discovered that it has been remarked that “it is easier to discover a new antiseptic than to find the requisite number of wounds on which to test the new antiseptics. It would take more than ten years to weigh the value of those we already have.

In this paper I will consider only a few that seem to best meet our requirements. I will first consider iodoform, for it is through the clinical study of the action of this drug that new discoveries have been made in regard to the processes of inflammation and suppuration. This drug was known in medicine as early as 1837, and has been used since 1864 by various surgeons as a dressing for ulcerative and granulating surfaces. It was first recommended as a valuable antiseptic

* *Druggists Circular*, Aug., 1889, p. 187.

† McGaskey, “The Inhibitory Action of Antiseptics” *Medical Record*, July 13, 1889. p. 34.

surgical dressing by von Mosetig-Moorhof, of Vienna, in 1880* It was immediately accepted as such and extensively used. Soon after various topic effects were noted, and in 1882 many cases of iodoform poisoning were recorded. By careful use it was found that its poisonous effects could be avoided, and owing to its many advantages it grew in favour and confidence of the ablest surgeons. Among its virtues is the property of extricating wounds and minimizing the secretions, of establishing asepsis in all wounds, of preventing the development of luxuriant granulations, its deodorizing quality in offensive wounds, its convenience and portability as a dressing, and its long continued action in wounds.”† “In 1885 von Mosetig-Moorhof reported over eleven thousand cases treated with iodoform without a single case of poisoning.”‡ “In 1887, after iodoform had been established, the surgical dressing for more than six years, two Danish authors, Chr. Heyn and Thorkild Roosing, published a treatise declaring that iodoform was destitute of antiseptic properties, worthless as a surgical dressing and even dangerous to apply to wounds.” By many practical tests they were able to demonstrate conclusively that iodoform would not inhibit or impede the growth of micro-organisms. This treatise raised quite a commotion, protests coming from prominent surgeons everywhere who discussed this question from a purely clinical standpoint and endeavoured to prove the antiseptic power of iodoform. Many bacteriological workers then repeated the laboratory experiments, and from their work the following conclusion was reached, “that iodoform may itself contain germs which might develop under suitable conditions, and that iodoform does not possess sufficient disinfectant power to kill some germs in soil when mixed with them in coarse powder and in considerable quantities. ... It was not long before it was found that there did exist certain germs upon which iodoform exerted a speedily destructive influence. For Buchner proved that even the fumes of iodoform differs upon different germs. He experimented upon fifteen forms of bacteria and endorses Buchner’s statement that some bacteria were retarded in their growth. ... The staphylococci and the streptococci (the germs of suppuration) were in no wise affected by iodoform, and this statement is the more interesting, because in the majority of cases in daily surgical practice efforts are directed mainly against the germs of suppuration. ... Langer’s

* Van Arsdale, “Present Aspect of the Iodoform Question,” *Annals of Surgery*, March, 1889.

† Ibid.

‡ Ibid.

experiments now also became known. He found, like De Ruyter and others, that when iodoform was introduced into the wound of a rabbit, at the same time with anthrax organisms, or at a later period, no antiseptic action resulted. If, however, the iodoform was first established in a wound and later anthrax was inoculated, no poisoning resulted. Such rabbits remained healthy.”*

The fact as agreed upon by all authors “that iodoform is not potent as an antiseptic in laboratory experiments still seems at variance with general clinical experiments, still seems at variance with general clinical experiments, for the custom of dressing wounds of all descriptions with iodoform is widely prevalent.” To reconcile this difference many experiments have been made and various theories advanced. Friedlander proffered a theory that iodoform exerted no influence upon the germs as such, but in some way so strengthened the vital action of the tissues as to enable them to win their conflict with the germs and thus resist infection. Another theory was that iodoform prevented the development of bacteria in wounds by drying up the secretions and causing food-famine. Another, which has been mentioned in many dental societies and admitted into a number of text-books, is, that the vital action of the tissues on iodoform set free pure iodine and thus exerted an antiseptic influence. Neudorfer, who believed that bacteria caused inflammation by irritation through the nervous channels, explains the antiseptic action of iodoform as rendering the sympathetic nerve-fibres insensible to such irritations. A new aspect was given this question when De Ruyter proved by experiments that pus had the property of decomposing iodoform so that pure iodine was formed. Sterilized blood serum did not have the effect of setting free iodine from iodoform, but as soon as the aseptic germs were added to the sterilized serum, decomposition of the iodoform proceeded as before. “Ptomaines without germs had a similar effect and alone could decompose iodoform ; but by this action ptomaines themselves were destroyed. In other words, iodoform exerted a chemical affinity towards the ptomaines and a new combination resulted by which the ptomaines were rendered inactive. Behring pointed out that in this manner iodoform was capable of preventing suppuration without having a disinfectant or inhibitory influence upon the micro-organisms of suppuration. Accepting this explanation “that the effect of iodoform in keeping wounds aseptic is the result of its action in binding the ptomaines it would be desirable to show, to strengthen

* Ibid.

this position, (1) that germs alone without ptomaines did not cause suppuration in wounds ; (2) that ptomaines alone without germs could cause suppuration in the tissues ; and (3) that ptomaines mixed with iodoform, but without the presence of germs would not produce pus in the animal body." "As yet experiments have failed to prove the first point, but it has been demonstrated that pus can be generated by ptomaines alone and that iodoform can prevent the formation of pus by ptomaines alone." From this clinical study of iodoform,* we learn that "certain facts have been developed which are of practical value, whatever may be the fate of the scientific theories involved. In dressing wounds the surgeon must hereafter use two different sets of antiseptics. He must seek as far as possible to exclude disease germs or to render them inactive, and for this purpose he must use germicides, such as corrosive sublimate. He must next endeavour, by applying agents like iodoform, to prevent the formation of poisonous chemical substances in the wound, or to decompose them and render them inactive if once they have been formed. These latter agents, if they, like iodoform, contain disease germs, must be disinfected before they are applied. Iodoform should be washed in corrosive sublimate solution. It should be brought into as intimate a contact as possible with the surface of the wound, and after its application the wound should be covered with germicide and protective dressings."†

Dr. Van Arsdale says : "The greatest benefit will be desired from iodoform by its use in operations about the mouth, vagina and rectum, where, owing to its property of destroying the ptomaines, it acts as a powerful deodorizer."‡

As already shown, the mouth is a breeding place for micro-organisms ; it is therefore essential for success in dental practice that careful study be given to this subject. One of the most valuable papers on *Antiseptics* is that by Dr. G. V. Black, read before the Chicago Dental Society and published in the *Dental Review* for Feb. 1889. A prominent feature of this paper is the "table of results of experimental tests of the value of antiseptics." In the *Medical Record* of Aug. 3, 1899 is a paper by Dr. J. E. Weeks, in which he gives the result of experiments showing the time required by different disinfectants to destroy the vitality of the micro-organisms. As an antiseptic and disinfectant, bichloride of mercury still stands at the head of the list. A solution of this in distilled

* Ibid.

† Editorial, *Medical Record*, April 27, 1889, p. 493.

‡ Van Arsdale, "Present Aspect of the Iodoform Question," *Annals of Surgery*, March, 1889.

water, standing, forms a precipitate. This may be obviated by adding a small amount of sodium or ammonium chloride to the solution. Dr. G. W. McGaskey says: "It is found, however, that the mercurial salt solutions will combine with any albuminous fluid forming an albuminate of mercury which is absolutely inert as an antiseptic."* In an address delivered in London the 4th of last November, Sir Joseph Lister says: "I had ascertained that when corrosive sublimate precipitates albumen, the precipitate is not as had been generally supposed, an albumate of mercury, that is to say, a combination of albumen as an acid with mercury as a base.The bichloride of mercury retains its properties intact, the albumen being loosely associated with it, in a species of solid solution, if I may so speak. Further, I had found that this precipitate, even after drying, is capable of being dissolved in the serum of the blood, and that the solution in blood-serum is powerfully antiseptic, while not irritating."† It has been found that when a little tartaric acid is added to the bichloride solution the albuminous precipitate is not formed. The proportions, one part bichloride, five parts tartaric acid, and one thousand parts of water, is about the proper strength to use. According to Dr. Weeks a solution of 1 to 500 destroys vitality in ten seconds; 1 to 1,000 in forty-five seconds, and 1 to 4,000 in two and a half minutes and, according to Dr. Black 1 to 50,000 will inhibit the growth.

Creosote has long been used in dental practice, although its disinfectant and antiseptic qualities were unknown. According to Dr. Weeks the pure creosote will destroy the germs in less than ten seconds. It dissolves in water in the proportion of about 1 to 250, and in this solution destroys vitality in exposures of thirty seconds; 1 to 400 in five minutes, and 1 to 800 in ten minutes. According to Dr. Black 1 to 910 inhibits the growth.

Carbolic acid, according to Dr. Weeks, 1 to 20 destroys vitality in one fourth of a minute, 1 to 60 requires four minutes, and, according to Dr. Black, a strength of 1 to 300 is the weakest solution that has an inhibitory action. These results show by comparison that creosote is a more valuable antiseptic and disinfectant than carbolic acid. P. Guttman

* McGaskey, "The Inhibitory Action of Antiseptics," *Medical Record*, July 13, 1889, p. 34.

† Lister "A New Antiseptic Dressing" *Medical Record*, Nov. 23, 1889, p. 562.

has lately tested the antiseptic properties of creosote after Kock's method, and he ranks it higher than carbolic acid.

Boracic acid or boric acid, derived from borax. This dissolves in three parts hot water or 25 parts cold water. According to Weeks this is useless as a germicide, as staphylococci pyogenes retained their vitality when mixed in a saturated solution and allowed to stand ten days. According to Black a strength of 1 to 150 is sufficient to inhibit.

Listerine, extensively used in dental practice, depends on boracic acid for its antiseptic powers. Its proportion of boracic acid is 1 to 30. According to Weeks, undiluted it destroys vitality in exposures of one minute, 1 to 2 in eight minutes. The peroxide of hydrogen ($H_2 O_2$) when of standard strength destroys vitality in exposures of one minute.

Eucalyptol, which the essential oil of eucalyptus, according to Weeks destroys vitality in exposures of from one to one and a half minutes. According to Black 1 to 380 is the lowest that inhibits.

Hydonaphthol, one of the recent antiseptics, its solubility in water is about 1 to 1,100; when used of a strength of 1 to 3,300 it inhibits.

Oil of cloves used in strength of 1 to 1,200 inhibits.

Oil of cassia used in strength of 1 to 4,000 inhibits in growth.

Boiling water, according to Weeks, destroys the vitality of mature germs on contact. "Creolin, the name of a new antiseptic and germicide, obtained from English coal by dry distillation, is said to possess the following properties for the destruction of microbes; it is ten times more efficient than carbolic acid; it is soluble in water, alcohol and glycerine; it controls hæmorrhage and pain; it limits suppuration; it does not injure the hands or instruments and is not poisonous."*

The question now is, how may the facts he presented be applied for our benefit? I will endeavour to give a few answers. First, to the proper cleansing of instruments. We should be particular about this. Every instrument after being washed in an antiseptic fluid before it is used in the mouth of another patient. For this purpose I prefer a saturated solution of hydonaphthol, it will not injure the polished surface nor cutting edge of the finest instrument. I have often allowed instruments to remain in this solution over twenty-four hours and never the least sign of rust was apparent on them. Be-

* Van Arsdale "Present Aspect of the Iodoform Question," *Annals of Surgery*, March, 1889.

fore opening into a dead pulp, dip the instruments into boiling water, or a strong solution of bichloride of mercury, this will completely sterilize them.

Second, before opening into a pulp chamber or canal, if the rubber-dam is not applied, have the patient thoroughly rinse the mouth with a good antiseptic solution. Then keep the point of the drill bathed with a solution strong enough to act as a disinfectant. For this purpose I prefer a solution composed of peroxide of hydrogen and a 1 to 250 solution bichloride of mercury, equal parts. I want the disinfectant to always advance ahead of the instruments, both into the pulp chamber and canals. In a paper read before the society three years ago I gave my treatment of alveolar abscess.* As that treatment is in accordance with the facts here presented I have found no occasion in modifying it.

Third, in the treatment of pyorrhœa alveolaris, frequent applications of an antiseptic is often necessary. For this purpose a solution of hydronapthol in my hands meets all requirements.

Fourth, after a cavity is prepared before inserting the filling it should be thoroughly disinfected and made aseptic. In the *Dental Cosmos* for Dec., 1889, there is an article by Dr. Miller on "the antiseptic action of filling-materials," which is worthy of careful reading and reflection. After detailing his experiments with the various filling materials, he says: "From these results we are forced to the conclusion that copper amalgam fillings exert a marked anti-bacterial influence upon the walls of the cavities containing them. ... We learn furthermore, that by incorporating certain antiseptics into the mass of the filling, or covering the bottom of the cavity before inserting the filling, we may produce an effect analogous to that of copper amalgam. ... Personally I have always had much faith in the preservative properties of copper amalgam fillings, because I have had abundant opportunity to observe the splendid results obtained by its use, even when very little care was taken in its insertion. The experiments which I have made have naturally served to strengthen my confidence in the material, in consequence of which I have used it to some extent in my practice in the last year." It has for many years been my practice in filling large cavities to fill two-thirds of the cavity with oxyphosphate cement and to cover it with amalgam or gold as the case may require. For over two years I have been using for this purpose, and also for capping pulps, hydronapthol

* *Independent Practitioner*, July, 1887.

with the cement, using equal parts hydronaphthol and cement powder. I am gratified to learn that this practice is endorsed by such high authority as that of Dr. W. D. Miller.

Fifth, by instructing patients in the proper method of cleansing the teeth and endeavouring to impress upon their minds the need of cleanliness in the mouth, if they wish to avoid the tortures they have to suffer at our hands.

After following the directions here given and having performed the operations with care and skill, we dismiss the patient—to what? To the same care and tender mercies of the micro-organisms they had before they came to us? If this is so, I candidly ask, with the knowledge we already possess, *is this method a professional one?* Is it not our duty to place prophylactic agents in the hands of patients, that they may counteract and destroy the enemies that are making such havoc? Is not the constant daily use of an antiseptic mouth wash plainly indicated? I have written this paper with the purpose of impressing upon your minds that it is as much a necessity to prescribe an antiseptic mouth wash, as it is to insert a filling.

The essential requirements in a mouth wash are, (1) that it shall be antiseptic; (2) that it shall be a deodorizer; (3) that it exert, at least, a slightly stimulating effect on the mucous membranes; (4) that it shall not contain anything poisonous, *i. e.*, if a large quantity be swallowed accidentally there shall be no danger; (5) that its cost be reduced to a minimum, to be within the reach of all patients; and (6) that it shall be freely soluble in water, and agreeable to use.

The bichloride of mercury is a powerful poison and should never be used in a mouth wash, unless in a very dilute mixture.

Boracic acid meets many of the requirements, and by the addition of menthol, thymol and gaultheria you will have almost the same thing as listerine. Listerine is an excellent mouth wash, a perfect deodorizer, the main objection being its expense. Hydronaphthol answers the above requirements better than any other antiseptic that we have, and from my own experience I can recommend it for this purpose.

And now in closing. To emphasize my conclusions I will quote from a paper read by Dr. R. R. Andrews before the Connecticut Valley Dental Society: "Who has not heard of the old essay of cleanliness of the mouth?" written in the second century by Lucius Apuleius, the author of the

story, "Cupid and Psyche." "An orator with gifted powers would declare that from him, above all men who have any care for the art of speaking, the mouth requires more sedulous attention than all the rest of the body, seeing that it is the vestibule of the mind, the gateway of speech, and the outer court of the thoughts. Nothing so ill becomes a man who is of free birth, and liberal education, as inattention to the appearance of the mouth. You look upon no feature before this while one is silent, none more frequently while in the act of speaking. Is one in the habit of washing his feet? Will he contend that greater care ought to be bestowed upon the cleanliness of his feet than upon his mouth? How in the name of misfortune is it consistent with reason to contend that one can have a clean and purified tongue, and at the same time a loathsome and offensive mouth? He that utters language that is pleasing, with good reason washes out his mouth before-hand, like a cup that has been prepared for containing a pleasant draught."

THE DANGERS OF HYPNOTISM.—At Nuremburg a case of some public interest has recently been tried in the police court. A commercial traveller, while in a restaurant told the waitress to look steadily at the white of his eye, and hypnotized her. On the second occasion he repeated the experiment, but this time the sleep was so profound that a medical man had to be called, who had the utmost difficulty in rousing the girl. The commercial traveller was accordingly summoned to appear before the magistrates, and the severe sentence of eight days imprisonment was passed on him, which will probably be efficient in checking similar performances in that region. In France the practice of hypnotizing people for amusement seems to be very common, and unpleasant consequences are reported. At a supper party in Paris one of the company hypnotized a girl and was unable to rouse her. She was consequently taken to the house of a medical man, and after a time she recovered consciousness. The whole party were taken in custody by the police, and were not released till next day. Even when hypnotism has been practised by competent medical men for remedial purposes, unpleasant accidents and ulterior consequences have again and again occurred, so much so that recently an order has been issued by the French Government prohibiting surgeons in the army and navy from practising it.

British Journal of Dental Science.

LONDON, AUGUST 15th, 1890.

MINERAL TEETH.

THE scarcity of platinum, to which we have referred from time to time in these columns, has, as all the Profession knows, necessitated an increase of 20 per cent in the cost of mineral teeth. It is not a very serious matter. It is only a return to the price asked but a few years ago, and will certainly make little or no difference in the Annual Balance Sheet of the Dentist. It was an open secret, that but for the action of one firm of manufacturers, this increase would have taken place some time since, but they, for reasons best known to themselves, possibly an idea that the price of platinum would not be maintained, delayed any action till quite recently. We have no doubt this delay must have pressed very heavily on some of the smaller manufacturers. It is not, however, our purpose to inquire into the wisdom or otherwise of this, the Dental Surgeon is perhaps a few pounds or shillings in pocket, and there the matter ends, but such a change has brought before our minds more prominently than is usual a few thoughts concerning these, too often glaringly artificial teeth. We do not deny, indeed we willingly enough admit, that there is a rate of improvement, but it is at a snail's rate, and not unlike this mollusc's mode of progress accompanied by a good many backslidings. We ask every one, is there any such improvement as we should expect and have a right to expect in these teeth? We know very well that

much may be done with these teeth, by grinding them to required shapes, by the method of placing them, by colouring them and by various other devices, to bring them more into harmony with those teeth by whose side they shall stand, or whose place they are to take. We have not the slightest wish to defend or exculpate those men who do not avail themselves to the full of the advantages which are offered them. But we deny that the choice of teeth upon the market is what we have a right to expect. The blame of this must undoubtedly be borne both by the dentist and the manufacturer, for the former is far too easily resigned to or put off with what he knows full well is not the right thing, nor the thing which he himself wanted, is all too frequently a disciple of the doctrine "Peace at any price." But we must protest the major share of the blame must be borne by the latter, for when one is desirous of obtaining any of those patterns which are good, such as the gum sections, or those which were devised for celluloid work, the difficulty in obtaining them, or rather the time and worry spent fruitlessly trying to obtain them, is simply inconceivable. The usual answer being that there is no demand and that it does not pay to keep a stock. Candidly speaking, a few fruitless searches is apt to check any demand there may be, but even if there is but little demand we should have thought if manufacturers had any pride at all in their productions, such as we used to be taught to believe was the characteristic of a British manufacturer, they would have cultivated what little there is, instead of meeting each and every query with a *non possumus*. It would be an absurdity to suppose that these should be manufactured and sold by the manufacturer at a pecuniary loss but this we would not ask ; we believe there are quite a number of men who would willingly pay an advanced price if the article offered real and not fancied advantages.

It is not without regret that some of us see the fairylands and folk of olden times become gradually forgotten. Born no doubt of ignorance, but none the less real to our forefathers they vanished as science explained the story of the "fairy ring" and of those other mysteries which seemed to give some semblance of fact to fiction. But the fairy-land of knowledge, from which science gradually lifts the curtain, grows apace in fascination. Prof. Roscoe reminded the St. Mary's Hospital Students of one of these facts, when he presented the prizes a week or so back. He said :—Metschnikoff has shown that certain cells of the animal body, termed phagocytes, identical with the well-known white blood corpuscles, being endowed with the power of independent motion, not only wander inside but also outside the tissue, and, *mirabile dictu*, pursue, devour, and digest any stray bacilli, whether pathogenic or otherwise, with which they come into contact. This is the true battle for life which, hitherto unknown and unobserved, is going on uninterruptedly within the animal body. These phagocytes are the watchful guardians of the body, upon whose action its health depends. You may observe their proceedings for yourselves under the microscope; you will see them fighting against the invading host and literally swallow them up. Poisonous bacilli are constantly present in the body. Pasteur's septic vibrio is always present in the intestines of the rabbit, but cannot pass through into the blood. Those causing diphtheria or pneumonia have been met with in the mouths of healthy men, and yet no entrance of such microbes into the blood takes place. Why is this? Because these phagocytes pursue and annihilate them before they can gain an entrance, and to them might be applied Cæsar's message, "Veni, vidi, vici."

PROF. ROSCOE was very urgent in his advice to young men to go in for scientific research but he recognized that :— "The mass of young qualified men cannot afford this luxury they have to earn their bread, often without much butter, and original work does not pay. Nothing would, in my opinion, do more to raise the status of English medicine than the

foundation of research scholarship of moderate amount to be given to the various medical schools in London. Make the conditions as stringent as you please, but give an opportunity to men having knowledge and ambition, and with time on their hands to do original work. A liberal beginning in this direction has been made by the Scientific Grants Committee of the British Medical Association, and the results are so far most encouraging, but this is only a beginning."

How True!—True for the Medical profession and equally for its Dental branch. Alas! there are not even "Grants" for Dentals. Perhaps our wealthy Odontological Society is waiting for the Dental Schools to lay the foundation by teaching their students how to begin the work. Until a man has gone through a routine course, following the footsteps of those who have gone before, he is far more likely to simply repeat these ad libitum rather than strike out a line for himself. As we have said before, at our Dental Schools such instruction, or even facilities for such a course, are only conspicuous by their absence.

THE STORY OF THE INTRODUCTION OF CHLOROFORM.—MR. JOHN MARSHALL, F.R.S., writes to the *Lancet*:—"In the letter of A. C. P., relating to the story of the introduction of chloroform, it is stated that, 'having inhaled several substances, but without much effect, it occurred to Dr. Simpson to try a ponderous material, which he had formerly set aside on a lumber table, and which, on account of its great weight, he had hitherto regarded as of no likelihood whatever. That happened to be a small bottle of chloroform, (page 204). Now, I believe the history and source of this bottle of 'ponderous material,' thus temporarily 'set aside on a lumber table,' is that it was sent to Dr. Simpson by the late Professor Thomas Graham from his laboratory at University College, where it had been made for use as a then rare lecture specimen. I believe that other rare 'etherial' fluids were also generously presented by Professor Graham to Dr. Simpson for trial. I can understand how, from its 'small size,' it was first set aside as 'lumber,' for I particularly remember that Professor Sharpey, my revered master, always, in relating this history, spoke of the kindness of Professor Graham in parting with this valuable specimen of a then novel and unused etherial fluid."

Abstracts of British & Foreign Journals.

THE DENTAL REVIEW.

GUTTA-PERCHA.

By EDGAR D. SWAIN, D.D.S., Chicago, Ill.

Gutta-Percha is the concrete juice of a tree known as the Isonandra Percha or Taban Tree. The tree attains a growth of from 2 to 3 feet in diameter, with a height of from 60 to 70 feet. The trunk is straight, the leaves alternate on the limbs and branches, their upper surface of a pale green, and their under is covered with a short, reddish-brown hair. The flowers are axillary from one to three in the axils, supported on short curved pedicles.

The wood is peculiarly soft, fibrous and spongy, pale coloured, and traversed by longitudinal receptacles and reservoirs, filled with the gum, forming ebony black lines.

The tree flourishes best on alluvial tracts of land, at the base of hills, which protect and favour its growth. When gutta-percha was first produced for commercial purposes, these trees formed the principal part of the jungle, but are now much scarcer, in consequence of their wholesale destruction by the Malayan natives.

Gutta-percha was first introduced into Europe as an article of curiosity in the form of sticks, whips, and other trifling articles, and not until about the year 1843 was it brought to the attention of scientists and manufacturers as an article of utility and value, by Sir Joze d' Almedia, a resident of Singapore on the Malay peninsula, who had observed the material in use among the natives as handles to their knives and other utensils, as a substitute for wood or buffalo horn. He first presented specimens to the Royal Asiatic Society of England in 1843, and received their letters of acknowledgment, which would indicate that this Society either recognized its commercial value, or looked upon it as a curiosity of no small importance.

William Montgomerie, Assistant Surgeon to the Residency at Singapore, was really the first to exert himself to bring it into general use.

The valuable qualities of the substance were no sooner publicly announced than it came into general use.

In 1844 the import into Europe was 200 pounds.

"	1845	"	"	"	22,477	"
"	1846	"	"	"	713,368	"
"	1847	"	"	"	1,236,368	"
"	1848	"	"	"	2,496,000	"

and into the United States in the latter year 122,626 pounds.

This increase in production was more than equalled by the increase in price, as in 1854 the price per ton was 21.25 dols. ; in 1862 it had run to 53 dols. per ton, while in 1877 it readily brought 1.25 dols. per pound or 2.500 dols. per ton.

The eager demand for the gum was productive of a reckless destruction of the trees which, in place of being simply tapped, were felled to the ground, stripped to their bark and the milky juice collected. Not more than 20 or 30 pounds from each tree could be secured by this procedure, and it is estimated that in three years at least 270,000 trees were thus destroyed. About this time an English company with large capital was formed which secured by sale and lease the remaining forests and commenced collecting the gum by tapping instead of felling the trees, thus preventing an otherwise inevitable failure in the supply.

Gutta-percha is a hydrocarbon, in its natural state nearly white, tough, and inelastic ; about 50° to 70° C. it becomes capable of being moulded, and it is this which makes it so valuable in the arts. It is composed of gutta, albane, fluavile in proportions of 78, 16, 6.

Gutta is completely insoluble in water or any kind of saline solution, fermented liquors, dilute acids, or strong alkalies.

Concentrated nitric and sulphuric acids attack it, the former with comparative rapidity, accompanied by effervescence, the result being a brownish, doughy mass, which subsequently hardens into a friable and nearly worthless compound. Sulphuric acid acts more gradually, but eventually disintegrates it, at the same time being itself decomposed with evolution of sulphurous acid.

Chloroform and carbon disulphide are its best solvents.

Gutta-percha is a poor conductor of both heat and electricity. It becomes negatively electric upon application of friction, and was first proposed for an insulator by Faraday, when perfect insulation became necessary that submarine cables might be made useful. Besides this it was found to be indestructible by water, fresh or salt. It is reported that sections

of the first marine cable, laid in 1857, which have been continuously under salt water, are in almost as good condition now as when first laid.

To purify crude gutta-percha from its many impurities, the crude blocks are first run through a machine which reduces them to slices, and these by another machine are reduced to small fragments; the fragments fall into vats of cold water, the gutta-percha floating while the sand and other heavier impurities fall to the bottom. The floating material is by an endless band conveyed to another tearing machine, when the process is repeated; this is repeated as many times as necessary, when the floating material is consolidated by rollers. It is then conveyed to vats of water, and steam admitted for the purpose of softening, and when in a semi-fluid mass is agitated, until the greater part of the grosser materials are removed. Thence it is taken to a machine called a "teaser," which consists of an iron driver lined with crooked prigged teeth; inside revolves a cylinder also covered with teeth, revolving at a speed of 800 revolutions per minute; in fact, this is on the principle of a threshing machine; here the material is again torn into shreds and falls into another vat of water, where the impurities fall to the bottom and the purified material is now transferred to the kneader or masticator, which is a strong iron driver with a fluted inside surface, in which revolves a cylinder with heavy cogs, the whole being heated by steam; here it is kept heated and kneaded until it is worked into a homogeneous mass, all air and water being expelled. It is now fit for the market.

Gutta-percha is adulterated mostly by mixing with it a substance of similar properties, called getah; it is the product of a tree, is grayish, clammy, and brittle, and greatly deteriorates the value of the true gum.

For our use it is necessary that it be still further refined.

Prof. Flagg informs us that he accomplishes this by hard work, kneading upon a plain iron slab to which is attached a handle carrying a wedge-shaped lug, both pieces polished and nickel-plated to give a smooth and somewhat greasy surface, the slab of course being kept warm enough to keep the material sufficiently plastic to admit of working. The other materials to be added are kneaded into it until a perfectly homogeneous mass is obtained. He informs us that five or six ounces per day is all that can be prepared by one man.

Mr. L. D. Caulk, manufacturer, says "I use the purest obtainable, it is selected, and then kneaded by a special

apparatus ; the greatest care being necessary to obtain and maintain the proper temperature ; with too small a heat it is impossible to knead, and incorporate with it the inorganic materials used, while too much heat easily ruins the entire batch."

Pure gutta-percha would not answer the purpose of the dental practitioner, and is therefore made harder or softer by the admixture of oxide and sulphide of zinc, aluminum, whiting, precipitated chalk, lime and silex. For the filling materials the oxide and sulphide of zinc are the most commonly used ; different manufacturers having their own formulæ.

"Hill's Stopping," was among the oldest and best known forms of gutta-percha offered the practitioner of dentistry as a filling material, and everything in the market now goes as Hill's Stopping, while it is more than likely that there has not been an ounce of the genuine material on the market in twenty-five years. Dr. Flagg says it is not known of what Hill's Stopping was composed.

The qualities especially recommending Gutta-percha as a material for filling carious cavities in teeth, are its non-conducting and non-irritating properties, both of caloric and electricity. Its objectionable qualities are its softness and its contractibility. One peculiarity connected with the latter property, however, is that the leaky condition does not always conduce to further decay. Dr. Flagg gives no theory to account for this. Dr. Caulk believes that sulphur is the preserving property. I therefore conclude that his preparations contain a certain amount of this article. A serious objection, however, is the stained or clouded appearance so common from this leaky condition, especially when used in the anterior teeth.

As to its uses for pulp capping there is a variety of opinions. It would seem that its non-conductivity should recommend it highly for this purpose. The American System of Dentistry teaches, and not without reason, that it is a very poor material for this purpose, from the fact that when exposed a long time to moisture it is liable to soften and expand, thereby producing undue pressure. My own opinion is that this is not the true cause of the failure, but, instead, the objections lay in its porosity ; continued exposure to the fluids exuded by the pulp decompose its surface, its pores are filled with them, their decomposition takes place, septic poisons are formed, and the pulp is by them destroyed.

As a root filling, it is my opinion, that it has no equal. Gutta-percha dissolved in chloroform, may be forced into the remotest part of the finest pulp canals, when they have been perfectly dried, and where this semi-liquid is not deemed sufficient, as in the larger canals, cones of the same material in size and form to approximate the canals may be forced into them.

When gutta-percha is used as a stopping for carious cavities, leave, where practicable, all healthy overhanging enamel, that as little of the filling material be exposed to wear as possible.

Dr. Ames furnished me some time since with a sample of his preparation for use in deciduous teeth ; it is a combination of pure copper and gutta-percha.

Many years ago an effort was made to produce a substitute for vulcanizable caoutchouc, by incorporating iodine and sulphur with gutta-percha. It was not sufficiently successful to materially affect the income of the Goodyear Dental Vulcanite Company.

Prof. Flagg, while he does not say it in so many words, leaves us to understand that gutta-percha is the best material that can be used. While I cannot fully agree with him, I must confess that were the profession to use more gutta-percha, use it with care, and put proportionately the same amount of brain work into the filling that is used with gold, our patients and ourselves would be the gainers thereby, and many teeth be made useful that are now sacrificed to the destructive and deforming practices of the forceps, and the unsightly display of gold bands and brazen crowns will be abrogated to innocuous desuetude.

THE LANCET.

AN ANOMALOUS CASE OF SALIVARY CALCULUS.

By EDMUND OWEN, F.R.C.S.

A LADY recently came under my care for a troublesome but painless swelling of the left cheek. The medical man who sent her to me suggested that it was a case of distension of a greatly dilated parotid duct, possibly caused by a salivary calculus. Unfortunately this gentleman did not accompany her on her visit to me, and on the most careful examination I could detect no calculus, but found the cheek of that side

somewhat prominent and unsightly. The lady said that she had been bothered by a swelling in that cheek ever since she was four years old, and that sometimes after a meal it was much more conspicuous than it was at that time. She was determined to have something done for the swelling, and I was content to hold my diagnosis as to the exact nature of the soft tumour in suspense until I could make a thorough exploration, which I did a few days later, Dr. Prickett kindly helping. There was then a rounded, doughy swelling of the one cheek, but no calculus was discoverable. Anæsthesia having been produced, and the jaws being separated by Mason's gag, an incision was made through the mucous lining of the mouth and the buccinator, a lobulated piece of yellow fat at once protruding. Gentle traction being made on this, a lipoma of considerable size readily left its bed between the buccinator and masseter muscles. The cheek was then flat like the other. It seemed as if no further treatment would be required, and nothing more was attempted. Within a few days, however, it became evident that the patient did not share our favourable view of the case. She said that on several occasions the cheek had swollen as badly as ever. Never happening to see the cheek, however, when swollen as she described, I thought it not improbable that her imagination supplied her with such evidence as I failed to discover. She was therefore advised to return home and to apply again should she meet with further inconvenience. In a short while she duly presented herself, and directed attention to a small, hard substance, which shifted its position over the masseter; it was evidently the salivary calculus of which her medical attendant had spoken. An attempt was promptly made to extract it through the mouth by reopening the old wound, but on introducing a pair of forceps the concretion slipped away and so effectually concealed itself that further search for it on that occasion had reluctantly to be abandoned. On a subsequent occasion on which the calculus was discovered I leisurely examined it from the outside of the cheek, and found that the limit of its journey forwards was just beyond the hinder border of the masseter, and that with the slightest touch it slipped back into a dilatation of Stenson's duct, which formed a wide chamber behind the angle and ramus of the jaw. From this pouch the calculus could be swept out by firm pressure. Sometimes it was no easy matter to bring it out again, as it hid itself on the inner aspect of the mandibular angle in the capacious chamber. Having been twice disappointed in the treatment

of the case when operating through the buccinator, I determined to cut straight down on to the calculus through the cheek, having chased it forwards and secured it by the finger pressed over the hinder part of the masseter. In this way its extraction proved a simple matter. The skin wound which which was closed with horsehair sutures, healed by first intention, giving no trouble whatever as regards leakage of saliva, and leaving a scar which, from the patient's point of view as well as the surgeon's, is now hardly noticeable. The calculus was a phosphatic concretion of the size and shape of a small date stone.

Remarks.—No one who has carefully dissected the face can fail to have noticed the pad of yellow fat which is lodged between the masseter and buccinator the little pellets of which obeyed the slightest touch of his forceps. But in the case under consideration the mass of fat far exceeded the normal amount, and when drawn out through the mouth constituted a lipoma of a very respectable size. Moreover, the swelling which had previously disfigured that cheek had so entirely disappeared that I felt justified in saying that the operation would prove entirely successful. Probably the irritation caused by the salivary calculus had brought about an over-nutrition of the fatty pad and so determined its hypertrophy, the other cheek remaining of normal size and appearance. Certainly the removal of the calculus alone would not have restored the symmetry, and had I extracted the concretion on the first occasion I might have hesitated to proceed to the ablation of the buccal lipoma, even if I had made a correct diagnosis of the nature of that swelling. Thus, as possibly not infrequently happens, failure on the part of the surgeon either in the way of diagnosis or treatment, worked for the good of the patient. As regards the removal of the calculus from the outside of the cheek, it is not an operation which one would generally recommend lest a troublesome salivary fistula should result, but, seeing the perfect way in which the wound healed the danger of such a contingency is probably over-rated.

BLEACHING TEETH.

A dirty-looking blue tinged tooth in the front of the mouth is so disfiguring to the appearance that the subject seeks the aid of the dental surgeon. Such teeth are too often recklessly

and ruthlessly excised, and an artificial crown attached to the root. The result is brilliant as far as appearance is concerned, and does not call for any great amount of labour on the part of the operator, but, at the same time, it is a question whether the true conservative treatment would not rather be to render the tooth presentable by bleaching and subsequent filling, which is practicable in a large number of cases. The most common cause of staining is the death of the pulp and the infiltration of the dentinal tubules with the products of its decomposition. Another cause, which is much more common than it should be, is the insertion of amalgam stoppings, especially those containing copper, and this stain unfortunately appears to be indelible. Two general classes of substances have been introduced for bleaching teeth--oxidising agents, such as chlorine compounds and peroxide of hydrogen, and reducing agents, as sulphurous acid. The treatment by means of peroxide of hydrogen is extremely simple, and gives good results; but it appears from recent experiments by Dr. Miller of Berlin that this preparation acts upon the dentine, removing the organic matter. Sulphurous acid is also open to a similar objection, in that its prolonged use will dissolve out the lime salts. Generally the chief chemical used for bleaching teeth is chlorine or some of its compounds. Where chlorine is used steel instruments are inadmissible, as the salts of iron which would be formed would rapidly discolour the teeth. The instruments must be constructed of gold, platinum, or ivory. In order to prevent the chlorine from passing through the foramen at the end of the root, which would probably cause acute periostitis, the apical third of the pulp canal is solidly filled with gold. The tooth is isolated at the gums, the soft parts being protected by the adjustment of the rubber dam, and the tooth thoroughly dried by means of a warm air syringe. The pulp cavity is then washed thoroughly with ether to remove any fatty material. Various preparations of chlorine have been recommended, but perhaps the simplest is freshly made chlorine water, as suggested by Dr. Wright, of Richmond, U.S.A., which is forced into the pulp chamber by means of a syringe. Three or four sittings of an hour each are usually sufficient to remove the discolouration, when the tooth can be filled in the ordinary way.

Lancet.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, June 2nd, 1890.

Mr. FELIX WEISS, L.D.S., *President*, in the chair.

The Minutes of the preceding meeting have been read and confirmed.

Messrs. A. O. Butcher, L.D.S.; J. Greenfield, L.D.S.; C. F. Rilot, M.R.C.S., L.R.C.P., L.D.S., having signed the Obligation Book, were admitted Members of the Society by the President.

Mr. G. W. Bateman, L.D.S., of 93, Ladbroke Grove, London, W., was balloted for and elected a resident Member.

The PRESIDENT mentioned that the Bye-laws had been reprinted, and suggested that Members should possess themselves of copies and read them over.

Mr. SIDNEY SPOKES then read the notes of a case of faulty enamel.

Mrs. L., æt. twenty-five, married, wished to know if anything could be done for her "brown teeth." On examination it was found that a central incisor in both the upper and lower jaws had recently been removed, in connection with necrosis of the alveolar process. The four first permanent molars were also lost. All the teeth present were of a brown colour, the upper ones being the darkest. Upon further enquiry it was considered that this unsightly condition depended upon a faulty construction and distribution of the enamel, which it was not possible to rectify. The approximal surfaces were affected by caries and, as the patient was anxious that something should be done, the defective teeth in the upper jaw were removed, as far back as the molars, and are to be replaced by artificial teeth on a plate. (The *model* was shown).

In ordinary cases of defective enamel we are accustomed to see transverse grooves across the teeth marking the period at which something occurred to interfere with the due formation of this tissue, but in the present case there are grooves in the long axis of the tooth, showing that the process was modified throughout the whole of the time occupied by

calcification. In some places there is a total absence of enamel, and the exposed surface of dentine seems to have been sufficiently hard to survive without the protection of the usual covering. In other places the enamel is laid on in regular masses. A section made through one of the bicuspid showed the transverse striation of the enamel prisms to be very plainly apparent, and there are spaces or channels to be seen running in the long axis, and these are in places connected by transverse branches, thus mapping out the tissue to some extent into "areas." The family history the patient gave was perhaps the most interesting point in the case. "Most of our family have brown teeth," and the accompanying genealogical tree presents a bird's eye view of her statement.

Table illustrating Mr. Sydney Spokes' Casual Communication on a case of Faulty Enamel.

Mrs. A. Six sons, three daughters	{	Mrs. B., B.T. Five sons, B.T. One son, W.T. One daugh., W.T.	{	Mrs. D., B.T. Mr. E., W.T. Mrs. F., B.T., at least two daughters, B.E. Six or seven children.	{	Son, B.T. Son, B.T. Son, W.T. Son, W.T.
Mrs. C., B.T., ...	{		{	Mrs. G., B.T. Three sons. Three daughters	{	Son, B.T. Daughter, W.T. Son, W.T. Daughter, B.T. Daughter, B.T. Son, B.T.
				Mrs. H., B.T., no children.		
				Mrs. I., W.T.,	{	Two sons, W.T. Five daughters, W.T.
				Mrs. J., W.T., three sons, W.T.		
				Mr. K., B.T., no children.		
				Mrs. L., B.T., daughter, W.T.		

Mrs. C. says that Mrs. A. told her that her (Mrs. A.'s) mother also had "brown teeth."

B.T. stands for brown teeth—W.T. stand for white teeth.

Both temporary and permanent teeth are brown. They are not so bad when first erupted, but seem to get worse with age. Some of the niece's teeth are much darker, "look almost black." One brother's teeth are worse, the other's better than Mrs. L's. Mr. Spokes concluded his communications by a quotation from Oscar Schmidt, who says, "The more stubbornly a character is transmitted, the greater the number of families, genera, and species over which a character

is extended, the more ancient must it be considered the earlier did it appear in the ancestral stock”

The PRESIDENT asked Mr. Spokes if he had seen any of the teeth to which he had referred.

Mr. SPOKES replied that he had only seen those in the patient's mouth; he had been promised an opportunity of examining the teeth of the mother, but had not yet seen her.

The PRESIDENT desired to know whether Mr. Spokes had had an opportunity of seeing a section of the teeth, and so of judging of the colour of the enamel below the surface.

Mr. SPOKES answered affirmatively, and stated that he had made a section of the teeth, but there was nothing much to account for the colour; it showed that the structure was bad; a good deal of porosity existed, the teeth absorbed something, and they became browner as they grew older. There was no question that the decoloration was not a surface condition, but was due to some inherent defect in the enamel.

Mr. WALTER H. COFFIN wished to know if he was correct in inferring from Mr. Spokes' remarks that in no case did brown teeth occur as a reversion through the white.

Mr. SPOKES said that was so according to the chart.

Mr. ALFRED SMITH then read the notes on a case of epulis.

At the request of his friend, Mr. A. T. Scott, he saw the patient, a girl, aged nineteen, in the month of August, 1889. On examining her mouth he found an epulis arising from between the left upper central and lateral incisors, about the size of a filbert, of which she gave the following history:—

In 1888 it commenced to grow, and in August, 1888, it was excised at a hospital in the north of London, and the patient was told to return if the growth recurred. It did recur, and in January, 1889, she presented herself again at the hospital. The surgeon then informed her that in order to remove it permanently it would be necessary to extract the adjoining teeth. Now her dentition being perfect, all the teeth in place, very regular, and not a speck of decay anywhere, she expressed great reluctance to submit to the operation and left the hospital to think the matter over, with the result that it was postponed until she saw Mr. Scott in August, 1889.

At the first consultation Mr. Smith thought of the usual treatment of excision, extraction and cutting away the septum of alveolus; but the girl again objected to the

extraction, and then Mr. Smith proposed excision and cutting away the septum with a chisel without extraction, but Mr. Scott suggested burning away the growth and destroying part of the septum at the same time with Paquelin's Thermo-Cautery.

The advantage of this instrument, which Mr. Scott had kindly allowed to be exhibited, is that the point may be kept at a white heat any length of time, by a stream of benzoline vapour forced into it (Mr. Smith demonstrated the action of the cautery).

Having obtained the consent of the patient the operation was undertaken with the cautery. The neck of the epulis was burnt through, and followed by the point of the cautery until the septum was reached, and this was then well charred. Very little hæmorrhage followed, and less pain was experienced as far as could be judged than that occasioned by the ordinary extraction of a tooth; but a very unpleasant odour of burnt meat pervaded the apartment. This was done on August 24th, 1889. In about a fortnight after the wound was healed. The patient had been seen several times since, and lastly that morning, and there was no sign of recurrence, although nine months had elapsed. Mr. Smith remarked that in all previous cases of epulis that have come under his notice, the growth had been associated with defective teeth or roots, the extraction of which had been indicated, and the cutting away of the septum rendered easy. He said he should be pleased to know if the cautery had been used before in similar cases, and if its use had been attended with success in preventing recurrence.

M. J. DENNANT (Brighton) exhibited a small contrivance, which was, he said, both very simple and very useful. He called it an iodine dresser. Most practitioners had doubtless experienced the difficulty that patients had in applying iodine to their gums, they generally stain their lips, and practitioners also stained their fingers. This contrivance, which could be made at an extremely small cost, consisted of a stem of black vulcanite with a slot at the top end, into which a little wool is twisted, and perfectly avoided the staining alluded to.

Mr. GEORGE BRUNTON mentioned that the staining could be avoided by using *tinctura iodi decolorata*, which does not stain the gums. It was made by dissolving a spirituous solution of iodine in *liq. ammoniæ*, and exposing to strong sunlight.

Mr. C. ROBBINS stated that he used a still cheaper instru-

ment which answered the purpose ; he always instructed his patients to use a common match.

Other members also mentioned having used an ordinary match for many years.

Mr. W. H. COFFIN thought that anything of this kind, which the practitioner used himself, was much more convenient if the end were bent at an angle.

Mr. BETTS thought that the great advantage of the lucifer match was that it could and would be thrown away when used, and a new one used next time. He did not think that there was the same certainty of the vulcanite stems being thrown away, however clean.

Mr. GEORGE BRUNTON felt that he owed some apology to the Society for introducing such trifling matters to their notice as the following, but he would run through them as rapidly as possible. First he wished to show some *bleached* rubber dam : it was easily done ; soak it in cold water and wrap it up. When dry it is white and will remain so for a considerable time. Secondly, he used a little pad (shown), for applying an astringent to the interior of the mouth, opposite the opening of the duct, and stopping the flow of saliva. He used a strong astringent known as chloralum, which stopped the saliva for a couple of hours, enabling him to work without the rubber dam. He also exhibited a few cutters for running round crowns and trimming roots for pivots. Sometimes he found that in using the syringe one was apt to squirt, and so damage a patient's dress ; to avoid this he used a piece of rounded glass with a hole in it, which he placed over the patient's mouth, introducing the syringe through the opening in the glass shield. Mr. Brunton also showed the kind of mouth mirror he used—of an oval form, the shape he personally preferred—into which he was able to fit glasses himself by running a little cement in warm—he used with the mirror an attachment to keep down the mouthpiece of the saliva ejector when working on the lower jaw. He also exhibited some rouge discs for finishing gold fillings ; they were made of a French paper known as “rogue” paper, and when both sides of the discs were required to be used, they could be made by glueing the backs of the paper together with shellac. Lastly, he had three models of cases taken from the mouth, which he would like to present to the Society if they were thought worthy of a place in its museum. One was a model of a syphilitic case showing “Hutchinson's notched” teeth.

Another, a remarkable spreading of molars in the upper jaw ; the upper were quite outside and overlapped the lower molars. The last case was one of six deciduous incisors in the upper jaw.

The PRESIDENT asked what cement Mr. Brunton used for repairing his mirrors?

Mr. G. BRUNTON : The same as supplied by the depôts for mending teeth.

Mr. WALTER COFFIN wished to know if that cement would stand immersion in hot water.

Mr. W. A. HUNT (Yeovil) said that he had himself found a difficulty with that very cement ; it underwent rapid expansion or contraction with heat or cold, and therefore would not do for anyone accustomed to put their mirror in hot water.

Mr. G. BRUNTON remarked that he never put his mirror in hot water ; any mirror would be rapidly destroyed in that whether that cement or any other had been used. By keeping it in the pocket it was always maintained at the requisite temperature.

Mr. KIRBY (of Bedford) said with reference to the very interesting model showing six deciduous incisors, he would like to ask Mr. Brunton whether he had had an opportunity of seeing his patient later and knowing whether the corresponding teeth in the permanent set were developed.

Mr. G. BRUNTON hoped to see the patient shortly—it was not one of his own patients. If he could take a model of the permanent set he would certainly supply it to the Society.

The PRESIDENT said the first paper on the agenda was one by Mr. LEONARD MATHESON, but with that nice consideration which he (the President) hoped would always distinguish their profession, Mr. Matheson had waived his claim to precedence in favour of Dr. Silk, who was a visitor, and so with the concurrence of the Society he would therefore call upon Dr. Silk for his paper. (Printed in our last issue, see page 681.)

DISCUSSION.

The PRESIDENT having invited discussion on Dr. Silk's very interesting paper,

Mr. W. A. HUNT (Yeovil) said that in order to save time he would at once take advantage of the President's invitation, and ask Dr. Silk a question. Twenty years ago, he gave up watching for dilatation of the pupils, and the cornea

for reflex movements, but he had observed sometimes that a tear would trickle down one side of the face only, showing clearly that the action of the sympathetic nerve of one side alone was affected. Had Dr. Silk noticed any inequality in the size of the pupils?

Mr. WALTER H. COFFIN wished to ask Dr. Silk on the point of dilatation, whether he was accustomed to give instructions to his patients as to closing the eyes? In many cases the patients close the eye before administration, in others the administrator told them to keep the eye open. He thought some difference in the size of the pupil might be accounted for in that way. He would also like to ask whether Dr. Silk advocated emptying the bladder before administration as a matter of routine.

Mr. L. MATHESON, interposing, desired to say that if any members were shrinking from discussing Dr. Silk's paper out of consideration for him, he should be quite willing to defer his paper to another meeting.

The PRESIDENT thanked Mr. Matheson, and said that it would certainly seem desirable with so good a meeting, which included several eminent anæsthetists, that they should fully discuss Dr. Silk's valuable paper.

Mr. GEORGE BRUNTON thought that the opportunity of discussing the paper should not be lost, and wished to say that some of the principal points had not yet been touched upon, one of them, viz., the pulse tracings, he should personally like to know more about, as many of their men were not in the habit of taking them at all.

Mr. WOODHOUSE BRAINE did not know whether they ought to have anything to say about ether. There was one little point: during the last twenty years in which he had given it, he had had five or six cases in which the patients—boys chiefly, under the age of sixteen—on the following day were very drowsy, and suffered from delusions, one person refused to take food, alleging that poison had been put into it. It was quite certain that the result of ether was in some, although rare cases, to produce delusions; and it had been pointed out by one of the physicians to St. Luke's Hospital that this condition had degenerated into idiocy. With reference to epilepsy in the administration of gas, Mr. Braine was quite sure it might be given with perfect safety to epileptic patients, and he knew of cases where gas had been administered while patients were under an epileptic seizure. He was called in to give gas to an epileptic in Bloomsbury

Square, and when he arrived the boy was in an epileptic fit ; Mr. Braine administered the gas notwithstanding, and when the boy recovered he did not have any of the after-effects of long sleep to which he had previously been subject. In these patients he had always noticed that they came under the effects of an anæsthetic very quickly. Referring to deepening of anæsthesia after the removal of the face-piece, he said he thought it was generally in cases of extraction of lower teeth that this occurred, and his explanation was that it was due to the tongue being forced back while being put out of the way for the convenience of the dentist. Mr. Braine very rarely gave gas in private a second time because the patients did not recover so well—it was quite a case of fees against comfort. With reference to rhythmic movements, he thought they very often began in a voluntary movement on the part of the patient to show that they were not insensible because he had asked patients afterwards and they had replied “ Well I thought if I did so, you would know I was not insensible.” He thought it a bad plan to allow them, because when commenced they often got exaggerated in the end, and the patient’s hands would get in the way.

Mr. G. H. Bailey thought that the Society should give Dr. Silk a hearty vote of thanks for his paper and for having given them the tabulated records of cases. He thought there was no doubt that those who were in extensive practice would find some difficulty in the way of keeping a tabulated record in private practice there would be diffidence on the part of patients in answering some questions. The question of sex would not present any difficulty, but age was a delicate matter about which to ask a lady. But in hospitals it could be done, and tabulated records should be kept. With regard to epilepsy, he quite agreed with Mr. Braine. In reference to after intensification of effects, Mr. Bailey said in taking out lower molars the patient would sometimes get semi-asphyxiated and the operator would become alarmed, but if the tongue were got out of the way the patient recovered. Mr. Bailey had never advocated pulling the tongue forward, and he had never seen the necessity of it if the gag is taken out of the mouth and the chin put up. With reference to pupil dilatation, his opinion was that in profound anæsthesia it is always dilated. He was perfectly sure that in all his own cases the pupil was dilated. In one case of extreme dilation the patient, a man, was delighted that he felt so comfortable after the administration, showing that the dilation had no ill effect. There

was a little difficulty when Dr. Silk talked about taking the face-piece off. Jactitation, which is the only known reliable symptom of complete anæsthesia, one got in five or six seconds. The mouth-piece is taken off, and he would say absolute anæsthesia continued for about twenty seconds; that seemed a short time, but a great deal could be done in it, one could extract a tooth in three seconds. Dr. Silk stated that he gave pure gas; Mr. Bailey was rather astonished at the quantity. Whether he (Mr. Bailey) was extravagant or not he did not know, but he usually marked off his 100 gallon bottles for fourteen inhalations, that would be about seven gallons for each patient. However, the best way to get at the actual quantity used would be to ask the house surgeon of the hospital, and this he would do. He thought even four gallons a small quantity: perhaps he did not give the gas in the way that Dr. Silk did. He (Mr. Bailey) gave it using a face-piece with an expiratory valve only, no inspiratory. He did not see his patients get blue. His Cattlin's bag was very small, only one-and-a-half gallons. Children were most liable to opisthotonos, women next, and men least. He (Mr. Bailey) could only remember a few cases of men having opisthotonos. One patient he had who fought a long time after the tooth was out—about half a minute; he was a very intellectual man his fears was that he should go off again. Mr. Bailey was perfectly sure that gas might be given in almost any condition of heart disease. He had chiefly risen for the purpose of thanking Dr. Silk for his very interesting paper.

Dr. DUDLEY BUXTON said that at that late hour of the evening it would be wholly impossible to attempt an adequate criticism upon Dr. Silk's paper. There were, however, some points upon which he would like to touch, in reference to the question of the advisability of administering nitrous oxide gas to epileptics and persons of unsound mind. Dr. Dudley Buxton proposed to offer the result of his experience, which had been pretty wide. It had been pointed out by Dr. Savage, of Bethlem Hospital, and by others, that attacks of acute mania had apparently been determined in those predisposed by the administration of laughing gas, chloroform and ether. It was a mistake, he thought, to suppose that true delusions followed such anæsthetics unless in the predisposed, and further, even in persons who had a bad family history, or had themselves been mentally affected he believed from his experience that such recurrence of attacks was very rare. In instances in which he had given gas to lunatics, for extractions

and for surgical operations, he had had no particular difficulties, and certainly none but what a little tact could overcome, and he had not met with exacerbation of the patient's condition as a result of the gas. Indeed, they had seemed calmer and more tractable after the administration of the anæsthetic. Epileptics and persons the subject of epileptiform convulsions, took laughing gas very well. Dr. Dudley Buxton did not think that taking that anæsthetic in any way increased the chance of their having a fit, but if a fit did come on he did not consider it any indication for discontinuing the anæsthetic. In a tolerably long series of brain cases with which he had assisted his friend and colleague, Mr. Victor Horsley, he had had to deal with many in whom slight causes originated epileptiform seizures, and in only one case had a fit occurred whilst gas was being given. Upon this occasion he went on with administration, and the patient became unconscious, while no complications occurred. Dr. Dudley Buxton asked whether Dr. Silk's cases were taken from records of hospital patients or of private patients, and he made the enquiry because he felt the statistics given must be allowed for in a different way, according as one or the other class was dealt with. Hospital patients were herded together in out-patients' waiting rooms and were, for reasons into which he need not enter, always very highly nervous and excitable, and not at all favourably placed for taking gas. It was a common remark for them to make as soon as they resumed consciousness, "Did I scream?" They went to sleep with the idea that they would scream, and as a result they awakened doing it. He thought to get the full value of the records of cases, that they should be divided into different classes, according as they were private or hospital patients. He did not quite agree with Mr. Bailey when he said it was impossible in private practice to elicit the required particulars. As a rule, the dentist knew the patient's family, and his (Dr. Buxton's) experience was, they were always most ready to help forward any investigation. He was quite sure that Mr. Bailey, with that suave manner which forms so conspicuous a trait of his bearing, could obtain particulars of his cases, and would by so doing, confer a benefit upon the profession. Turning to the question of heart disease, he would emphasize most strongly what Mr. Bailey had said. He was quite sure that valvular disease of the heart was *per se* no reason for refusing to administer gas, but rather a strong reason for giving it. The only cases that had in his hands given rise to

unpleasant symptoms, were those of the functionally feeble heart, and the heart weakened by degeneration of its muscular coats. He had no hesitation in saying that even in these cases the effects of the shock was far more likely to be detrimental to the well-being of the heart than could be those of nitrous oxide gas when properly given. There were many other points upon which he would have liked to have touched, were he not warned by the procession of time that all things must come to an end.

Dr. Silk felt that he had to thank the Society very heartily and sincerely for the very kind manner in which they had received his remarks. He had no idea that he would be displacing anyone, or leading to a transfer of business to another evening. He was very sorry that Mr. Matheson's paper should have been postponed, at the same time he was very much indebted to him for having allowed his paper to take precedence. There had been so many speakers who had raised questions of the greatest importance that he could not hope to answer all of them at that late hour. Mr. Braine had raised the question of ether, and he (Dr. Silk) hoped Mr. Braine would not think he was being treated cavalierly if he said with Mr. Bailey that he regarded it as rather outside the scope of the paper. With regard to epilepsy he did not know of any reason why gas should not be given in such cases. With reference to rhythmic movements, the rhythmic movements as he meant them, were distinctly not those which commence with the patient drawing attention to his condition; they were not the movements of lifting the warning finger, they were the movement of the knee. Mr. Bailey had said something about the after intensification of the stertor. Dr. Silk was glad that Mr. Bailey agreed with him that there was an after intensification for about twenty seconds, that might account for the fact of the pupil being dilated; but what he wished to point out was that before the dilatation you get jactitation and so on. Some question had been raised by Mr. Bailey as to the quantity of gas, Dr. Silk did not regard the point as of much importance, but one could very readily see that with no inspiratory valve Mr. Bailey's average and Dr. Silk's were easily accounted for; he did not think there was any great discrepancy. Dr. Dudley Buxton had asked if the recorded cases were those of hospital or private patients; he (Dr. Silk) did not quite agree with him as to the difference between one class of patient and the other: it was rather a difference of degree than of kind, which educa-

tion alone would account for. In reply to Mr. Hunt's question, Dr. Silk said he had not remarked any inequality of the pupils. With regard to opening or shutting the eye before administration, as suggested by Mr. Coffin he generally found that the patient was placed in the full glare of the window, and he did not know that any difference would be made in shutting the eye. His average was taken from a large number of cases, and any slight difference there might be would reduce itself. He should think that in the majority of cases the eye was open. With reference to urinating, he thought all administrators would endeavour to get the bladder empty but it was not always possible; it was a good routine practice.

The usual vote of thanks having been passed, the President announced that the next meeting of the Society would take place on November 3rd, when the adjourned paper by Mr. Leonard Matheson, would be read "On some Practical Points in the Relation of the Upper to the Lower Teeth;" also a paper by Mr. Storer Bennett, "A description of some Interesting Specimens of Comparative Pathology at present in the Museum."

The meeting then adjourned.

Dental News.

THE Library of the Royal College of Surgeons will be closed during the month of September for cleansing purposes.

THE Council of the Hospital Sunday Fund, at a meeting held at the Mansion House on Monday, July 28th, ordered the payment of the amount available for distribution, namely, £41,061 to 168 institutions. £39,101 was voted to 113 hospitals and 55 dispensaries, and £2,050 for surgical appliances.

THE DENTAL STUDENTS SOCIETY OF VICTORIA.

The first annual meeting of the above Society was held on June 17th, at 8 o'clock in the Society's room, Melbourne Coffee Palace. The retiring President, Mr. L. A. Carter, D.D.S. in the chair. There was a fair attendance of mem-

bers. The principal business transacted being the election of office-bearers for the ensuing year; reading of the Secretary's and Treasurer's Reports, and revising Rules, which placed the status of the Society on a more liberal basis. The Secretary's report showed that the work of the Society had been most beneficial, and reflected credit on those who had taken part. The Treasurer's Report stated a substantial balance, notwithstanding the drawback of expense necessary for the first outlay. Both reports were adopted. A hearty vote of thanks was accorded to the retiring officers, coupled with the name of Mr. W. H. Morton, who has so kindly acted as hon. pianist during the past season. An election of office-bearers for the ensuing year then took place, the ballot resulting as follows: Mr. C. H. Mansfield and Mr. Fitzgerald, Vice-Presidents; Mr. S. White, Hon. Treasurer; Mr. C. Haddon, Hon. Secretary; Messrs. Mansfield, Fitzgerald, White, and Haddon, Committee. The meeting terminated with songs and recitations, in which the following gentlemen took part—Messrs. Ramsay, Morton, Ham, Litts, Fitzgerald, Mansfield, and White; Mr. W. H. Morton officiated at the piano.

THE SELECT COMMITTEE ON HOSPITALS.

Miss Manley was next called, and said she was formerly a sister in the children's ward of the London Hospital. She remembered the case alluded to by a previous witness, in which it was alleged that one of the medical staff was intoxicated, and that she had refused to allow him to inject morphine. She absolutely contradicted the statement that the medical officer was intoxicated. He was very kind to the patients. The statement as to his intoxication was absolutely without foundation. The patients were not allowed to be washed until six o'clock in the morning, but it was possible that children in the Queen's Ward might be washed at four o'clock in the morning. It was not the custom for towels to be used by many patients.

Dr. Wethered, house physician at London Hospital from January 1 to June 30, 1886, said that whilst he was house physician to Sir Andrew Clark he never knew of the wheeling of patients out of the ward during Sir Andrew Clark's visit.

The Rev. Mr. Brookes, who was formerly assistant chaplain of the hospital, spoke to his belief as to the treatment of a certain probationer in regard to which he complained. However, Miss Luckes afterwards stated Mr. Brooke's version was not in accordance with facts.

At the Eighteenth meeting,—the Rev. H. T. Valentine was re-examined, and said he wished to contradict some of the statements of Mr. Roberts and Mr. Carr-Gomm, and to say most emphatically and specifically that he had never said he should try to injure the London Hospital.

Mr. Roberts was recalled to answer certain questions with reference to the minutes.

Mr. Busch, house physician of the London Hospital in 1884-85, was then called, and the Chairman read over to him the evidence of Miss Homersham in relation to the alleged use of some abusive language and a charge of drunkenness, and the Witness, in reply to a question as to whether the allegations of Miss Homersham were true, stated that he denied them, and said the charges were absolutely false. He further denied that he was at any time drunk during his service in the London Hospital. The assertion as to the administration of morphine was also false. He never used insulting language to the nurses. He asked if the statement of Miss Homersham was privileged, because it might do him a deal of injury?

The Chairman replied that the statement was absolutely privileged.

Mrs. Perry, said she was for $3\frac{1}{2}$ years sister in the London Hospital. With reference to the food, she said that the eggs were bad for a time. Many of the children were awake at 4 in the morning, and she never prevented the nurses washing them, if awake. The food was sufficient and the nurses were not overworked. It would be better if the hospital authorities expended more money on the nurses, although of course it must render the number of patients comparatively less, at the same time I think it would be very dangerous to have idle women in the wards.

Dr. Samuel Fenwick, F.R.C.P., stated that he had been attached to the London Hospital for twenty-two years. Originally he was asked by the House Committee to attend all the nurses. Formerly each nurse chose her own medical man from among the medical staff. That did not work very well. Then he was requested to see all the nurses, but from want of time he was unable to do that, and therefore he sug-

gested that he and his colleague Dr. Sutton, with Mr. Treves, of the surgical staff, should undertake the work. If any nurses complained of not being well, either himself or Dr. Sutton would see them. If he or Dr. Sutton were not present the nurse would see the house physician or surgeon. He considered that there should be an older man always available for consultation at every large hospital.

He should like the number of nurses increased, but I fear economy is a great object. He thought that fourteen hours with two hours off, or twelve hours with two off, far too long. He, would you like to see the honorary visiting staff paid at the general hospitals. He was not satisfied with the system of medical education which exists at the present time; He thought the London University to blame, it ought to be a teaching university, and certain hospitals registered clinical instruction.

Mr. Treves, F.R.C.S., surgeon to the London Hospital, said he had been five years assistant surgeon and six on the senior staff, and had been connected with the hospital for nineteen years, beginning as a student. He had surgical charge of the nurses. The charge of neglect to attend the nurses was unjust. No nurse suffering from a surgical malady during the time he had been at the London Hospital had ever passed for any kind of treatment without seeing him. The statement that members of the staff did not visit the nurses' sickrooms was also unfounded. The work of nurses is obviously hard. It is a large building, and there is, of course a great deal of walking. The bulk of the nurses were, in perfect good health. The system of registration of nurses was unfair to the public, as it placed all nurses on the same level, whether efficient or not. The system of registration had been opposed by the majority of those experienced in nursing. There were a good many of the nurses who had to be sent away as physically unfit for the work. The matron was exceptionally kind and considerate to the nurses. The house surgeons and house physicians were the picked men of the entire college, and were the very best men.

At the Nineteenth meeting,—Miss Mackey, the Matron of the Throat and Ear Hospital, Golden Square, said she was previously night superintendent at the London Hospital. She had nine wards under her charge. She considered the wards at the London Hospital understaffed. Some of the work given to the nurses should be given to the charmaids. The witness continued that the hours of duty of the nursing staff

—fourteen hours—were too long. She thought their holidays too short. There was a good deal of grumbling among the nurses. I consider there was not a sufficient staff for the night nursing. I also think the food was not satisfactory.

Miss Ellen Yatman, recalled, stated that her reason of leaving the London Hospital was entirely because of her breakdown in health.

Miss Eva Luckes, the matron, was then re-examined. She very seldom sent out to private patients other nurses than those connected with the nursing establishment. It is not reasonable that she should jeopardise the hospital by sending to private patients nurses required for hospital patients. Hospital nurses should be much better paid than they are at present. Probationers were fairly well paid except in regard to washing, and they should all be allowed 2s. 6d. a week for washing. The nurses were only entitled to a fortnight's holiday, but she would like them to have a month's holiday. The hospital make a profit out of private nurses.

Mr. W. J. Nixon, the House Governor of the London Hospital, said he had been 44 years in the service of the hospital. He received £880 and a furnished house. For the first 20 years he was secretary of the charity, and for the last 15 years he had been house-governor. He could scarcely define his duties, because every day provided its duties. He was responsible for everything that went on in the hospital, except in reference to the secretary and the chaplain. He was a sort of general-referee. The matron was mechanically responsible to him, but that has lapsed, and she is responsible to the house committee. On the subject of the financial support of the hospital the witness said that although the necessary expenses greatly exceeded the reliable income he could not say they had any difficulty in raising funds. They did not tout for custom. The money came in, for the public had always responded, and he believed they always would. The total number of persons permanently employed at the hospital was 451. Up to a certain extent he should himself order structural work and repairs to be done, but if a very large expenditure were necessary he should consult the house committee. There was an architect, who received £200 a year as surveyor to the hospital, and who was sometimes engaged also as clerk of the works when extensive works were required.

At the Twentieth meeting, Mr. Roberts (Secretary of the London Hospital), said, there had been no fault found with the accounts since he had been secretary. The accountant

went systematically through the whole books. There was a treasurer, but no finance committee. The Foresters and other societies obtained letters in return for subscriptions and were frequently made life governors. They were rather handicapped by the fact that the Hospital Saturday and Sunday Funds distribute letters among the works in the district, and the men do not subscribe because they say they can get hospital letters elsewhere. Collectors who obtained subscriptions received 5 per cent. commission on all old subscriptions and donations, and 10 per cent. on new subscriptions. A great many country unions sent up severe cases, and they paid the Hospital a certain amount for their treatment. Systematic appealing for the charity he did not think paid so well as occasional special appeals. The auditor is responsible for the accounts. He goes through them. The salaries and wages, £14,842, which is one-third of the total expenditure.

Mr. John Henry Buxton, the Treasurer of the London Hospital, stated that some of the receipts with respect to the nursing department were given as net, and some as gross. He thinks the accounts are extremely clear, as they show the whole expenditure and receipts. The balance goes into the assets of the hospital. He was in favour of the affiliation of dispensaries with hospitals. He would very much like to see some controlling power with regard to new hospitals. He hoped that some day they would have some system of inspection of hospitals, but with the greatest possible care that there should be no interference with the management. The management was so good that if the present managers were interfered with they would no longer continue to be governors of the hospital, and it would do endless harm. But inspection without interference and power given to prevent the erection of new hospitals and special hospitals until leave were given from the central body, would be an admirable improvement.

The surgery is not open to any man unless he is a Fellow of the Royal College of Surgeons. The number of candidates for these appointments, who are excellent men, is so large that there is not the slightest difficulty.

Mr. W. H. Nixon, recalled, said that the appointments to the senior medical offices were somewhat tied, but with regard to the qualifications for the house-physicians, he gathered from the rules that they were not so tied. He did not consider, from the rate of mortality among the nursing staff at the London Hospital as compared with the mortality at other

hospitals, that there had been anything serious resulting from defects in the sanitary arrangements at the institution. There was, he said, a special officer appointed to ascertain the age, social state, number in family, income of applicant and family, whether in sick club or the receipt of parish relief and other particulars. That system had materially reduced the number of out-patients. The results of the inspection were especially valuable in choking off persons who were not above coming to sponge on the hospital resources. The cost of the system of inspection at the London hospitals was about £150 or £160 a year, and it had been very beneficial in rejecting unworthy cases. The hospital had never been overcrowded since the new wing was built. It was overcrowded in places, but not as a hospital. That was impossible. There must be a limit drawn somewhere where the overcrowding must stop. He had not heard that the medical staff complained of their patients suffering from the overcrowding of wards, but of course they must suffer to some extent.

LEGAL INTELLIGENCE.

At the Portsmouth County Court, before his Honour Judge Leonard, William Henry Kirton, L.D.S., of Elm-grove, Southsea, sued Miss Ellen Smith, of Little London, Chichester, for £10 10s. for a set of teeth supplied.—Mr. Burbidge was for plaintiff, and Mr. Cooper, of Chichester, for defendant.

Plaintiff said he had done previous work for Miss Smith, and on the 22nd of August she arranged for a full set at ten guineas. She made no objection when they were inserted, she expressed herself as satisfied and was able to take a cup of tea and some bread and butter.—Then when she got to Chichester, she seemed to think she did not look so young, and did not like her expression.

One day she came with her sister with whom he had some altercation as she interfered by advising her sister not to have the teeth—although the latter expressed herself satisfied except that she said they did not make her look young enough, which plaintive explained was impossible owing to the angularity of the jaw due to old age.

Mr. Cooper : One of the reasons for having teeth is to speak as perfectly as possible, and they ought to be able to speak perfectly?—Plaintiff : That is not my experience after thirty years.—Mr. Cooper : If another dentist has made

teeth for Miss Smith, and she speaks clearly, and she could not speak clearly with your set, would you consider yours a success?—Plaintiff: I would. I know it was a success, and she was perfectly satisfied with it.

Mr. Cooper: On September 26th she wrote that the teeth made her look idiotic when she smiled. If a person looks idiotic when she smiles is that a fit?

Plaintiff—You have all kinds of smiles.

Mr. Burbidge—We don't undertake to make smiles.

Plaintiff—You can have a contemptuous smile, a jolly smile, or a melancholy smile.

Mr. Cooper—If she smiled naturally before wearing your teeth but idiotically after would you think that was preserving the contour of the face?—Plaintiff: I don't know whether her smile was idiotic or natural before she came to me.—Mr. Cooper: If she did not naturally smile idiotically before, she ought not to have smiled idiotically when she had your teeth in?—Plaintiff: No.—Mr. Cooper: Ought she not to be able to read properly?—Plaintiff: She could eat properly. That is the most important part.—Mr. Cooper: Is it not important that she should be able to read distinctly?—Plaintiff: It is more important that she should be able to eat.

The boy who attended to the surgery said defendant complained when she had the teeth in that she did not look the same as when she was younger. She did not say anything about her appearance being altered by the teeth.

Francis Lloyd, mechanical dentist, who had worked for plaintiff for four years, said the models and teeth were true in every particular.

Mr. Cooper contended, for the defence, that the teeth supplied were never correct and never fitted properly, but another dentist had succeeded perfectly in supplying defendant with a set of teeth which answered in every respect.

Both sets of teeth were handed to the Judge, and he said the teeth in dispute appeared to be made to fit the mouth, and the others to be made by machinery.

His honour gave judgment for plaintiff with costs.

VACANCY.

National Dental Hospital, 149, Great Portland Street, W. The post of House Surgeon is vacant. Applications to be made to the Secretary, on or before September 1st, enclosing testimonials.

British Journal of Dental Science.

No. 543. LONDON, SEPT. 1, 1890. VOL. XXXIII.

SOME GENERAL CONSIDERATIONS ON THE TREATMENT OF IRREGULARITIES.

BY J. F. COLYER, L.R.C.P., M.R.C.S., L.D.S.

Assistant Dental Surgeon at the Charing Cross Hospital.

IRREGULARITY has been defined as a departure from the normal type.

That irregularities are on the increase is undoubted, and with the increase we have, also, that of the badly nourished teeth. It is this latter which causes the Dental Surgeon the utmost perplexity in giving an opinion, and in the following remarks we propose to consider some general points which claim our attention when deciding upon a course of treatment.

Like many other troubles, irregularities can often be avoided by paying careful attention to the mouth during the period of eruption of the second dentition, judicious filling of the temporary teeth, and extraction of them at the proper period being important factors in this prophylactic treatment.

By carefully filling the temporary molars, their premature extraction is often avoided, and the first permanent molars prevented from moving forward, so causing crowding of the erupting teeth.

Judicious extraction is also important, for undue persistence of the temporary teeth in many cases retards eruption, or causes irregularity.

A good rule is that temporary teeth should not be retained after the time has arrived when they should in the ordinary sequence of events be "shed."

When deciding upon a line of treatment, several points will require careful consideration, and it is an excellent plan to take models, for a careful study of these will often elucidate points which would be missed by simply examining the mouth.

One of the first points to consider will be the age of the patient, for an extensive operation undertaken at an early age might tax to a great extent the vital powers, while, if delayed to a later period, health and strength being greater, it might be undertaken with better results.

On the other hand, too long delay may bring about more complications and difficulties.

Roughly speaking, twelve to fourteen is about the best time to regulate, but naturally, no hard nor fast rule can be drawn.

After age, the sex of the patient should not be lost sight of, for certain lines of treatment which are sometimes admissible in a boy, are not always so in a girl,—appearance in the latter being of the greatest importance.

The temperament of the patient must be taken into consideration; some children submitting to the inconvenience of plates, &c., others not.

The patient's position in life, whether well-to-do or otherwise; the distance to travel for each visit, must both effect our decision.

The facial expression and features must also be considered; for instance, many good-looking people, especially women, have contracted mouths which are in harmony with the rest of their features; in such cases an operation like expansion, could not but fail to mar the beauty of their expression.

We should never lose sight of the fact that nature endeavours to set matters right herself, and teeth, which appear irregular at an early age, will often become quite regular if left alone,—the influence of the tongue and lips being great factors in bringing the teeth into a regular line.

Turning to the teeth themselves, their character as to whether weak or strong, should certainly weigh with us; as mechanical treatment in the one may lead to worse results, in the way of caries, than the leaving of the irregularity.

A very careful examination of all the teeth should be made with the probe and mirror, especial notice being taken as to the presence of decay on the approximal surfaces of the molars and bicuspid. The direction of the roots of the teeth must also be ascertained, if this is not done, a tooth, when regulated, will in some cases slope to such an extent, as to look worse than before treatment was commenced. It should always be borne in mind that a tooth does not move bodily, but only swings upon its apex.

After that of the teeth, a careful examination must be made of

the relation of the alveolar border to the body of the bone, observing whether the bone is contracted at this part. In contracted arches careful attention to this will often save subsequent disappointment in treating a case.

The question as to whether the deformity is hereditary or acquired, must also be taken into account, the former being much less amenable to treatment.

Lastly, with reference to the teeth, we must examine the "bite," the importance of this proceeding will be subsequently referred to.

The theory of "Travelling of the Teeth" should be kept clearly in view, this practically means the capability of the teeth to shift their positions in the alveoli without mechanical aid, for example, if all the first bicuspid have been extracted, it will be found that the teeth behind have a tendency to move forward, those forward having tendency to move backward.

The question of Extraction or Expansion in crowded mouths may with benefit be alluded to at this part. Without doubt there is no condition of the teeth which requires more careful consideration, in order to discover the correct line of treatment, than this class of case.

With reference to expansion it is an excellent way of gaining room, but it must generally be confined to those cases which are of the acquired form. As to what happens in expansion is not quite known, and it is an excellent subject for some careful and accurate observations.

Extraction on the other hand, is in its place an excellent method of gaining room, and should be adopted in those cases where the teeth are weak in structure, and where there is the slightest tendency to interstitial caries. Extraction in these cases is conservative treatment.

Expansion is naturally best adopted when we have fairly strong teeth, and can often be combined with extraction to advantage.

When we deem it necessary to extract, we shall often be perplexed as to which teeth should be sacrificed, but when decided upon, they should be removed without delay.

Care should be taken to avoid, if possible, extracting front teeth, especially in girls. The sex of the patient is often of great importance to us in determining between the extraction of individual teeth, when for instance, the question lies between lateral and canine, we should hesitate to extract the lateral in the girl, on account of the appearance, such not being

the case in the boy. Carious teeth should naturally be sacrificed first, and always a tooth as near as possible to the seat of irregularity.

A moot point often arises as to whether the first permanent molar or bicuspid should be extracted. Our judgment must necessarily be to a great extent guided by a consideration of the relative merits of the teeth. In favour of saving the molar, we have the fact that it is physiologically the most important tooth in the whole arch, presenting the largest area of crown surface, situated where mastication is greatest, and admirably adapted to bear the strain thus put upon it, inserted as it is into the malar process, the thickest portion of the maxillary bone.

Against retaining the molar in preference to the bicuspid, we have the fact that it is more liable to caries than any other tooth. In favour of sacrificing the bicuspid, we should remember that it is not so important a tooth, physiologically, as the molar, and further, if extracted, allows the irregularity to be corrected more quickly.

Again, we must not forget that if the first permanent molar remains healthy till the age of twelve, it will be less prone to interstitial decay than even the bicuspid.

Considering these facts we would advise as follows :

1.—If the molars have caries on the approximal surfaces, they should be extracted in preference to the bicuspids.

2.—If the molars have only carious places on the crown surface such as can be filled with reliable gold plugs, and the approximal surfaces are free from caries, they should be retained and the bicuspids extracted in preference.

In the above we have assumed that the bicuspids are free from caries, if, however, this is not the case, then, naturally, we should be inclined to extract them, but in such cases no definite rule can be laid down. The question as to which bicuspid to remove, the first or second, also requires a passing word. Statistics point to the fact that the second, is, if anything, more liable to caries, and from that point of view should be extracted, considering, however, the fact that the case will in all probability be more quickly corrected by extraction of the first, and also that the liability to caries is nearly equal, we are inclined to advise extraction of the first in preference to the second in the majority of cases. Still there are a few cases in which the second can sometimes be extracted with advantage, viz., those where room is required to the extent of about half a tooth. If the first bicuspid is removed a space will remain between the canine, when it comes into place, and

the second bicuspid which in a girl will look unsightly ; in these cases the second bicuspid can be extracted with advantage, as the space will then occur between the first bicuspid and the molar and, naturally, will not be so easily visible. When employing extraction as a remedy for irregularity keep clearly in mind the condition of the bite, endeavouring if possible to extract in such a manner that nature herself will remedy the case without mechanical aid. When removing a tooth in either jaw it is as well, in most cases, to remove the corresponding opposing one, this is especially the case with the first permanent molars. If a normal articulation is examined, it will be seen that the surfaces of the bicuspids present practically two planes the one anterior and the other posterior, the anterior of the upper opposing the posterior of the lower. Each act of mastication brings pressure upon these surfaces, and as long as the arch remains intact, the resistance both in front and behind will remain equal, and therefore, the position of the teeth will not alter. Should, however, the resistance in either direction be removed by extraction, then each act of mastication will tend to drive the teeth back in that direction. When the first permanent molars are extracted it is brought about as follows : The posterior plane of second lower bicuspids will act upon the anterior of the second upper, and drive it back, the posterior plane of the first upper bicuspid driving back the second lower bicuspid, and so on. In such cases as these, regulation plates can be to a great extent abandoned—a most important point. There, are naturally, many who are opposed to this view, namely, extracting a corresponding tooth in the opposing jaw, and especially in reference to the molars, holding that it is not legitimate. The best answer to this is to consider a case in which, perhaps, only the molars in the upper have been extracted, on carefully considering the bite, it will be seen that the lower molar is practically no use, since the opposing tooth has gone, still more, it will be seen that the second upper bicuspid is locked, and hence will require mechanical aid to force it back, and when brought back will articulate with a molar crown surface, and will be of but little utility.

Some extract dissimilar teeth in the opposing jaws, but the disadvantage of this will also be readily seen by considering a likely case in which say the first permanent molar has been removed in the upper, and the first bicuspid in the lower. Here, not only shall we have all the disadvantages just pointed out, but the first upper bicuspid will also be robbed

of its masticating surface. Extraction after this manner is therefore to be avoided when possible.

In extracting, the centre of the mouth should be taken into consideration. Many argue that if a tooth is removed on one side, endeavour should be made to remove one on the other. When extracting canines, incisors, or bicuspid, it is certainly important, more especially with the former two, but when the tooth in question is a second bicuspid or molar we do not think its unilateral extraction will have much effect upon the centre.

These then are some of the points which require attention when giving our decision, and the successful dental surgeon will be he who takes a broad view of his case, carefully weighing all the facts.

HOBBIES, AND HOW TO RIDE THEM.

A Presidential Address by L. DRESCHFELD, Esq. *

Gentlemen,—In the first place I wish to thank you sincerely for the honour you have done me in again electing me your president. I am not conscious of any particular merits by which I could have gained such an exceptional mark of confidence and distinction. I have gladly accepted once more this honourable office, but I question, without wishing to appear very modest, whether your choice has been a good and wise one, for I believe it would conduce much to the prosperity and the usefulness of this society, if you would choose a president out of the midst of the present or former students. This is done in other students' debating societies, and has its great advantages,—it gives your society a more independent character ; it makes the younger members, who have naturally less experience, less timid to express their opinions and join in the debate ; and it would widen the sphere and range of subjects on which papers are to be read. I feel so convinced, especially when I look upon the management of kindred students' debating societies, that this republican form of presidentship, would be of great advantage that I would strongly recommend to you to elect my successor out of the students past or present, especially as your body

* Read before the Students' Society, Victoria Dental Hospital, Manchester.

is getting more numerous, and as after all, the office of president does not involve great responsibilities, or require the possession of great experience or of great mental powers,—were these the necessary attributes of a president, then you ought never to have elected me.

In the next place, gentlemen, I have to respond to your request, to open this, your first meeting with some introductory remarks. This, I confess, is not so pleasant a task; for my oratorical powers are unfortunately of a very low order, and the choice of an appropriate subject has puzzled me very much. I am not to speak on a special nor technical subject, for this would be encroaching upon the domains of the active members of this society, and as regards general subjects, there is scarcely one, on which others, more competent than myself, have not spoken, and spoken better than I could. That our profession is a noble one,—one that is getting more and more allied and closely allied to the medical profession, has been so often dwelt upon, and is now a theme a little worn out—that our profession is not a remunerative one, you will learn soon enough, and I would not like to discourage you by relating the many troubles and hardships a dentist is put to, and how often in spite of industry, abilities, and care, he has to struggle hard : he fills the teeth of others with gold, but they do not fill his pocket with that useful commodity. Other subjects, such as dental legislation, recent advances in dentistry, have all been dealt with, and so there is scarcely a professional subject on which I could speak. Under these circumstances, I thought it might not be altogether out of place to say a few words about “Hobbies, and how to ride them.” It is a subject which is, after all, only indirectly concerned with this society and its work.

How often has not the pursuit of a favourite study led to the discovery of great things, especially in England. Englishmen, are particularly noted for individual freedom and energy of action and to these sterling qualities must be assigned the astonishing facts that so many Englishmen, distinguished in science, art and literature have sprung from the farm and workshop and have by their own energy and industry reached the pinnacle of fame. Take for instance John Hunter, he received little or no education and even at 20 he acquired with difficulty the art of reading and writing, he could not even boast of a good memory and had to put down everything in writing to supplant this defect, he worked for some years as a common carpenter in Glasgow and then he found his

brother William who was a medical practitioner in London. He devoted his leisure hours to the study of comparative anatomy and as a result of this, at first amateur work, we have the fine collection of specimens at the museum of the College of Surgeons, which is not equalled by any in Europe. He was a busy practitioner and it was only in his leisure hours that he could find time for his anatomical and physiological researches, which I need scarcely tell you, will stamp him for ever as one of the best and most original thinkers of his time.

The life of William Cobbett again shows how some men had to grapple with difficulties. Speaking of how he learned the English grammar he says "When I was a private soldier on the pay of 6d. a day, the edge of my berth, or that of my guard-bed, was my seat to study in; my knapsack was my book-case; a bit of board lying on my lap was my writing-table; and the task did not demand anything like a year of my life. I had no money to purchase candle or oil; in winter time it was rarely that I could get any evening light but that of the fire, and only my turn even of that. And if I under such circumstances, and without parent or friend to advise or encourage me, accomplished this undertaking what excuse can there be for any youth, however poor, however pressed with business or however circumstanced as to room or other conveniences?—To buy a pen or a sheet of paper I was compelled to forego some portion of food, though in a state of half-starvation, I had no moment of time that I could call my own; and I had to read and to write amidst the talking, laughing, whistling and brawling of at least half a score of the most thoughtless of men, and that, too in the hours of their freedom from all control. I think not lightly of the farthing that I had to give, now and then for ink, pen and paper. The farthing was, alas! a great sum to me; I was as tall as I am now; I had great health and great exercise. The whole of the money, not expended for us at market, was two-pence a week for each man. I remember, and well I may, that on one occasion after settling all necessary expences I had, on a Friday, made shift to have a half-penny in reserve, which I had destined for the purchase of a red-herring in the morning, but, when I pulled off my clothes at night, so hungry then as to be hardly able to endure life, I found that I had lost my halfpenny! I buried my head under the miserable sheet and rug, and cried like a child! And again I say, if I, under circumstances like these, could encounter and overcome this

task, is there, can there be, in the whole world, a youth to find an excuse for the non-performance? ”

The object of this society is not only to give you opportunities of reading papers of professional interest, it is also a kind of debating society, and as such gives you practice in speaking and may enable you some day to become public speakers, perhaps political ones also. This is in some respects already a hobby. I have no desire to dilate on this particular subject—it is right, nay essential for the welfare of a country, that all citizens should interest themselves in politics, and professional men form no exception to this rule, and it is only under exceptional circumstances that love of politics, when carried to an immoderate degree becomes a hobby. As yet I do not know that many dentists have played an important part in politics, we have no dentist amongst the members of parliament, very few are aspirants for municipal honours. It is different with the medical profession, that both on the continent and here, medical men have taken an active part in politics and not to the detriment of their own profession, Virchow in Germany, Farquarson in England. Speaking of hobbies generally, I can but say it can only be beneficial, if dentists, like other professional men occupy themselves with all subjects besides those relating to dentistry. The advantages are manifold, such occupations have a fascination of their own, they prevent a young man from temptations which allure him on all sides, unless he has some profitable employment for his leisure hours, they find useful recreation when he rests from his daily toils, and they form a useful pastime for him in after life, when from age, from infirmities and from other causes, he has to lessen his professional work or give it up altogether, and when actively engaged in his profession they often form an incentive to renewed and vigorous work. Dr. Carpenter in his mental physiology, relates of the inventor of the binocular microscope, that he pondered long over the mechanism how to produce such a microscope, tired out with work and unable to pursue it any further, he sat down and for a few days occupied his time chiefly with reading novels, after thus diverting his thoughts into another channel, and giving his brain a rest, he suddenly found the right formula and succeeded at once in constructing the binocular microscope. It is well therefore, that we dentists should, apart from our profession, occupy ourselves with some useful work or pastime, it would not detract us from our work, on the contrary it would enable us to com-

mence our daily work fresh and untired. Literary pursuits will form one of the most agreeable and useful of pastimes—it is not likely that we should all succeed like Oliver Wendal Holmes, he is a born genius and poet,—but without aiming so high the pursuit of literature elevates the mind, acts as an excellent mental discipline, and improves the general culture. I can therefore only strongly advise you to cultivate literature in its different branches.

The best known instance of what can be accomplished by pursuits of this kind, even without a teacher, is the discovery of the Nineveh marbles, and the deciphering of the cuneiform description on them, by three self-taught men—a cadet in the East India Company, a clerk in the East India house in London, and a lawyer's clerk in a solicitor's office. Sir Walter Scott was a copying clerk, and could only devote his evenings to reading and study.

Smiles, in his excellent book on "Self-help," says of self-culture,—“We can elevate the condition of labour by allying it to noble thoughts, which confer a grace upon the lowliest as well as the highest rank. For no matter how poor or humble a man may be, the great thinker of these and other days may come in and sit down with him, and be his companion for the time, though his dwelling be the meanest hut. It is thus that the habit of well directed reading may become a source of the greatest pleasure and self-improvement.” A nobleman once contemptuously asked a sage, “What have you got by all your philosophy?” “At least I have got society in myself,” was the wise man's reply.

Science again has its particular charms and usefulness. There are many parts of natural science that can be profitably studied; which besides enlarging our knowledge, and educating our minds, form pleasant pastime; take, for instance:—Botany, Zoology, and Chemistry, and practical Physics. We already use much mechanical apparatus and ought to be conversant with practical mechanics, and there are many dentists who, apart from mechanical dentistry, employ their leisure hours in practical mechanics, such as carving, &c. An equally fascinating and useful subject is music. I do not know of any great musician amongst our dental profession, yet there must be some amongst you, who have practised some instrument or are good singers. Let me entreat them not to neglect their musical studies—they can practise music and without neglecting their professional work. Amongst medical men there are many instances where even those who

stand highest in their profession cultivate this muse. Professor Billroth, one of the first surgeons in Austria, is an excellent violinist, and has often played in concerts. Professor Rutherford is not only a good singer, but had established and conducted himself singing classes for medical students, and so I might prove many more instances. Leaving literature and science, there are other pastimes which can with advantage be indulged in. Rowing, swimming, the athletic sports, and the English national sports. The old proverb about the "Dull boy Jack," applies with equal force to dental students. The use of these manly sports is so evident, and so well recognized, that I need not dwell on this subject at any length. I am not sufficiently *au fait* to tell you whether there are any dentists among the famous cricketers, footballers, or athletes. Dr. Morgan, in his book on our University oars, has shown how many of these first-rate rowers became afterwards famous lawyers, doctors, officers and politicians. Lord Palmerston was one of the best rowers, jumpers, and swimmers of his time, and many others are well known.

In Manchester, there are not a few who besides the arduous work of their profession, which they practise successfully, devote a good deal of time to the pursuit of arts or science. I wish therefore to recommend to you not to neglect literary culture or the study of any experimental science, not for the sake of a pleasant pursuit. The advantages are great and obvious ; apart from the pleasure and intrinsic benefit which you derive from such pursuits, they will prevent you listening to temptations which beset you, not only those who practise in large towns, but also those who live in the country ; you will, as I have said before, take more pleasure in your profession, and commence your daily work fresh and invigorated ; you will lastly, when, from natural causes which I hope may not come into operation with you for many years, you are no longer able to work hard at your profession, find an outlet in the pursuit of your favourite hobby.

SOME REMARKS.

BY J. S. CASSIDY, M.D., D.D.S., COVINGTON, KY.

DOCTOR FAUGHT in a recent number of the *Dental Cosmos*, under the head of "American Want of System in Dentistry," seemed to deplore the fact of there being widely diverging views in regard to methods of practice in the various and varying operations we are called upon to perform.

That there is a lack of system in American dentistry, can hardly be conceded, but of course, there is a difference in some of the means employed, and intended, perhaps, to attain the same final result.

Dentistry is not a fixed science, and in the nature of the case never can be. It is largely experimental, therefore necessarily progressive, involving the consideration and employment of means to ends by each practitioner, according to his own recognition of the truth, although agreeing in the main, with the general concensus of opinion in regard to the special case in hand.

People do not dress alike in civilized countries,—albeit the late introduction of the divided skirt, may be the adumbration of more uniformity in this respect,—and no one will say that the object of clothing our bodies either for comfort or to please the vanity of individual taste is not accomplished.

And so it is with our work. We cannot always see things by the same line of vision that others see them. For instance : some one describes a case in practice. It may be the capping of what he terms an exposed pulp. The writer or speaker, goes on to say that after removing all the diseased dentine possible, he applied applied a paste of zinc oxide and oil of cloves, over that, zinc phosphate, and then finished with gold or amalgam. He claims that all such operations were permanently successful in his hands.

Now in my mind, I probably see the real condition of the part : the pulp was still covered by sufficient dentine to render his procedure safe and eminently proper, although by the way, you might prefer to use a thin shaving of gutta-percha wet with chloroform or oil of eucalyptus, instead of the oxide of zinc and oil of cloves. But how many will see the case in this light? Perhaps the majority will suppose the pulp was actually exposed, and therefore honestly jump to the conclusion that such practice as described will not

prove permanently successful. They say, it would be better, to destroy the pulp at once, and thus be fully assured of saving the tooth.

Both views are correct, according to the assumption that the pulp is, or is not, really exposed.

Again, a gentleman describes his method of treating root canals. Having in his mind perhaps, only one condition for treatment, his therapeutics are of course directed to that condition only. It may be an aching pulp easy of access. He applies arsenic, removes the dead organ, swabs out the canal with carbolic acid, or some other coagulating antiseptic, and fills at once. Some of us will object to this procedure because we have in mind cases where putrefactive changes are occurring; we therefore denounce the use of carbolic acid or other coagulant, claiming that the insoluble albuminous phenates, etc., dam up the dentinal tubuli and thus prevent the escape from them of the putrefaction products. We may think we are looking at the same thing through the same spectacles, but we are not.

In the first place the removal of the recently devitalized pulp leaves the canal in an aseptic condition; but in order to prevent the possible submission of the yet bleeding apical thread, and of the contents of the tubuli, to bacterial influence, an antiseptic should be used; and of these carbolic acid, or some of its combinations, such as campho-phenique, is assuredly one of best.

To coagulate or mummify a substance with a true antiseptic, is a helpful means of preventing the growth of bacteria therein, and to the same extent the prevention of decomposition.

On the other side, if we assume that the pulp has been undergoing putrefaction more or less, involving the contents of the tubuli in the process, then we should agree with Dr. A. W. Harlan that a coagulant is contraindicated. In such a condition it would not be clinically safe, nor compatible with theory to seal up the contents of the infected area.

In some cases, however, according to Dr. W. D. Miller, putrid pulps are found devoid of bacteria. They had been there and perished probably by lack of material to forage on, after having exhausted their supply of nourishment in the pulp; or perhaps they died by the poison of their own excrement. At any rate, we should accept Dr. Miller's statement as correct, and there are at least exceptional bad smelling root canals, where a coagulant would not be a *damming* quantity.

Indeed, it is always proper to avoid denouncing your brother's methods until you have, like the good old country doctor in Read's novel, "Put yourself in his place"; and it follows in all reason, that it is rather too dogmatic for anyone to lay down invariable rules for treatment of many sided diseases, and expect them to be observed by other equally intelligent practitioners. This statement certainly applies to the treatment of root canals, which parts present conditions differing almost as much in degree as in kind and number. Slight differences of opinion, acquired by experience in the treatment of assumed similar cases, do not, it seems to me, involve a breach, much less a weak place in the scientific system on which our profession is erected; on the contrary foundation principles in therapeutics are universally observed.

Thus we all agree that in the preparation of root canals for filling, a necessary operation, is the more or less complete removal of the broken down matter therein. This operation then, whether performed by aid of burs and drills and broaches only, or these combined with chemical agencies to secure cleanliness of the part, is a necessity; but how we misunderstood each other by misapprehension, for instance, of the uses in such cases, of disinfectants, germicides, and antiseptics? Disinfectants were in use long before the present doctrine of bacteriology was evolved, and were employed to destroy the infectious matter produced by certain diseases; but lately we have introduced another class of remedies the germicides, which, as their name indicates, are intended only to kill the germs, some brethren believing that if the germs alone are destroyed, and the living parts, as it were, thus sterilized, the other concomitants of the fermentative or putrefactive process are rendered harmless. In this idea, however, we are inconsistent for we endeavour to destroy also the products of the process,—even though we may not be personally acquainted with them,—such as the ptomaines, ammonia and its derivatives the amines, and phosphine, hydrogen sulphide, etc., from the canal.

For this latter purpose we employ agents, which at present we are pleased to term disinfectants. Now if we select different agents for this purpose, whether of active oxidizing or deoxidizing power, we accomplish our object without violating the rules of scientific therapeutics.

We have unconsciously come to regard the use of germicides, *per se*, of little consequence; that is, if we treat the

part with disinfectants followed by *antiseptics*, and the sealing of all openings against the admission of culture fluids, we can expect the germs themselves, if any are still there, to remain in a state of innocuous desuetude.

Whether it be a root canal after thorough disinfection, if it required such treatment, or a simple cavity in a living tooth after the decayed matter has been removed, both being thus in a comparatively healthy condition, and therefore ready for the final operation of filling, is it not in accordance with both science and experience, that the part should receive, as a parting medication, an antiseptic, in order to barricade against future possible encroachments of the practically omnipresent bacteria?

Experiments have shown that bacteria, or even ordinary parasites, will not germinate in organized structure that has been fairly subjected to the influence of antiseptics; and in those cases of disease which require disinfection as a preliminary step, to be finally succeeded by an antiseptic, is it not a great convenience, aside from the question of non-coagulation, to have quite a number of drugs which combine in a high degree the virtues of both disinfectants and antiseptics? We find such drugs in what are called the essential oils, thanks to Dr Harlan for his persistent advocacy of them for this purpose.

Chemists have known from time immemorial that essential oils exposed to sunlight developed ozone. Indeed it is well known that the terpenes, $C_{16} H_{16}$, when exposed to the air absorb oxygen more or less, which they give up readily to oxidizable bodies; and experiments made by Kingsett seem to suggest that the oxidizing compound is a terpene, either isomeric or poly-meric with oil of turpentine, $C_{10} H_{16}$, but oxygenated by having lost two atoms of hydrogen and taken up four atoms of oxygen, viz., $C_{10} H_{14} O_4$. This compound, in the presence of water and summer heat, is converted into hydrogen peroxide and camphoric acid. According to the equation,

Oxygenated terpene, water, hydrogen peroxide, camphoric acid,



Now whether we name the oxygen given off by hydrogen peroxide as ozone, or merely nascent, makes no difference; in either case we know it is active oxygen, the most determined enemy of infectious matter known to science.

Of the camphor compound, it is needless to say that cam-

phoric acid is an excellent antiseptic, in virtue of its ability, as well as the camphors in general, to prevent the growth of microorganisms.

A few more words in order to sustain the caption of this paper. I have been asked quite frequently, why is carbolic acid an alcohol and not really an acid? It is not because an organic acid is an oxygenated hydrocarbon radicle and hydroxyl? This definition necessarily implies at least two atoms of oxygen in the molecule, and as carbolic acid or phenol, C_6H_5OH , has only one atom of oxygen, it is relegated to the alcohols whose molecules are made up of hydrocarbon radicles and hydroxyl, and may contain one group, or two, or three groups of hydroxyl according to its kind.

The alcohols as a class are better antiseptics than are the corresponding organic acids; so the term phenol alcohol, applied sometimes apparently in derision, instead of carbolic acid, need not, at least in this connection, be considered as a slur.

In conclusion permit me to call attention to the well known fact, namely, the more rapid disintegration of zinc phosphate fillings at the cervical border when under the gum, than elsewhere. It is conceded that in that position putrefactive change of the surrounding debris takes place most readily, resulting in the development of organic alkalies, which takes away the phosphoric acid to such an extent as to render that portion of the filling of uncertain value.

To overcome this difficulty I have been trying the addition of just a little carbolic acid—so-called—full strength, to the liquid at the time of mixing, and have found in the majority of cases so treated three or four years after insertion, a condition of stability most remarkable. Is this condition due to the presence of the antiseptic phenol alcohol? or were the cases experimented with favourable for the purpose? Ordinary cleanliness at any rate was not a factor in the, to my mind, remarkable presentation of the filling. Try it.

THE CAUSE OF MANY FAILURES IN DENTAL OPERATIONS.*

By L. P. BETHEL, D.D.S., TOLEDO, O.

To talk over ones failures and investigate or inquire into the cause of them is beneficial to every practitioner, especially in making him more careful about observing the little points in operating that help make up many of the failures in operative dentistry.

While, perhaps, already enumerated again and again they will yet bear repeating.

We often observe failures in gold fillings from not having solid borders to the cavity. These can be obtained only by the removal of all impaired tooth substance. It is not enough to merely remove the visible decayed portion for the tooth substance is generally softened more or less beyond this point and care should be taken to cut away all such softened structure. The treacherous white spots should be removed and the cervical wall cut down until thick and solid. There has been a tendency on the part of some operators to leave the borders thin or comprised mainly of enamel. At the cervical wall it is tapered to a sharp edge or a groove is cut entirely across and the border thus weakened.

In striving to oblige patients and have as little gold show as possible in the anterior teeth, many fillings are sacrificed by leaving a thin wall of enamel on the labial side. The lingual wall is often left a mere shell of enamel that will stand but a comparatively short time. These points are hacknied to be sure, yet there are far too many operators at the present day who, through carelessness or other cause seem unmindful of them, yet they all predispose to failure and too much care cannot be taken in preparing the cavity for a gold filling.

Over-malleting is undoubtedly injurious and improperly finished borders of the filling, especially the cervical, invite decay.

In using amalgam the same care should be taken to obtain solid borders and no wall be left composed merely of tooth enamel, for such walls after a time become friable under the amalgam filling and break down. The exclusion of moisture from the cavity when using amalgam I consider as necessary as for a gold filling, although many operators claim that in the packing of amalgam into the cavity the moisture is

* Read before the Northwestern Ohio Dental Society, at Toledo

thoroughly expelled. To obtain the best results from these fillings much probably depends upon the mixing of amalgam and the means of inserting it. An amalgam should be used as dry as possible in most cases, and be thoroughly packed. I have contracted the habit of applying an excess of the material to both proximal and grinding surfaces, where admissible, to assist in drawing out the surplus mercury by pressure, and find that it leaves the filling more thoroughly condensed and solid at the borders. Neglect to finish the filling properly to the borders predisposes the tooth to decay. For cutting away the excess of amalgam and finishing the filling on the proximal surfaces of the teeth, the composition silver strips of Dr. E. Parmly Brown answer the purpose admirably. They will readily pass between the teeth and are so pliable that when used as a tape they conform to the shape of the tooth and remove all excess of the filling material leaving smooth edges.

I believe a mistake is often made in bevelling the borders of a cavity for amalgam, especially where a brittle edge alloy is used, yet some operators persist in so doing. Another cause of failure we sometimes find where the cavity has previously been filled with cement and some portions left adhering to the borders to dissolve out and invite decay. To guard against this I have found it advantageous, when using cements for temporary purposes, to fill almost to the borders, where they have been cut down to the proper shape, and finish the filling with gutta-percha, or when using the cement alone, to remove all decay from the cavity leaving the borders to be shaped when the cement is removed. I seldom use a matrix in filling with amalgam as I believe in most cases a better filling can be made without its use.

There are so many cements on the market that it is difficult to give a general rule as to mixing to obtain the best results. Some require mixing thick and then softened by rolling between the thumb and fingers, while others will not stand this manipulation. The peculiarities of the cement one uses should be thoroughly studied. Probably, however, the best general results are obtained from mixing the cement as thick as it will work well, thoroughly incorporating the powder. Probably many failures in cement fillings come through using the material too thin; the acid crystallizing in a freer state thus rendering it more easily attacked by alkalis, neutralized, and the bond of union, with the powder, broken down. This seems to be especially liable to occur at the cervical borders

of proximal fillings, where the fluids of the mouth are held between the surfaces or under the free margin of the gum. Another cause of failure of these fillings, especially at the cervical border, is in permitting minute portions of foreign materials such as blood, debris, or even a slight trace of moisture, to remain on the borders of cavities, for they make the filling imperfect at that point. It seems to me that if proper precaution is taken in manipulating and filling with these materials they can be made to last longer and do better service.

Failures in root fillings are probably due more to filling before thorough disinfection has been accomplished, but a root may be thoroughly disinfected and prepared yet filled in such a manner as to allow secretions to gradually accumulate in the canal and there decompose, lighting up the old trouble at the apex. This comes generally through faulty manipulation, although sometimes, perhaps, through carelessness in applying medicaments, before filling, that are incompatible with the filling material. For instance, if the cements are used the root should not be wiped out with any of the oils but bichloride of mercury and such antiseptics are preferable. In using gutta-percha, oils may be used for they are compatible with this substance. Whatever material is used for the filling should be thoroughly adapted to the root walls and this requires time, patience and *thorough* manipulation.

Lastly, I may add that far too many failures of fillings come through the neglect of patients to keep the teeth brushed and the mouth properly cleansed.

These are but a few of the many little points that should be thoroughly observed in operating, but enough perhaps to provoke discussion.

IMPLANTATION.*

By FRANK HART, D.D.S., Toledo, O.

My subject for this evening will be Implantation.

There have been a great many papers written on this subject, but as yet I have seen none that gave a detailed description of the operation, one that would justify the operator to undertake without a more thorough knowledge of the minute

*Read before the Northwestern Ohio Dental Society, at Toledo.

points. The operation is one that any dentist with a little care and an anatomical knowledge of the parts should be able to perform. What might be called the mechanical part of the operation is little more than being able to bore a hole in a board to fit a plug. As no doubt there are some here that have never seen the operation performed, I will try to make it as plain as possible. I will first give you a short history of transplantation, replantation, and implantation.

Transplantation is the extraction of a tooth from the alveolar socket of one person and inserting it in the alveolus of another person in the socket where a tooth has just been taken from. This operation dates back into the sixteenth century. Cases are reported where ladies of the nobility had teeth affected with caries extracted and sound ones taken from their waiting maids substituted. Similar cases have been reported up to the present time but with a small degree of success. Some bad effects had followed this operation, which, no doubt, arose from the fact that the tooth and patient were not given proper antiseptic treatment.

By replantation is meant the extraction of a tooth and replacing it in the same socket. There has been very little written on this subject up to the present century, yet there is no doubt but that it has been practised more or less for a number of centuries and with greater success than transplantation. The large number of cases of replantation is where the wrong tooth has been extracted or removed by accident, and in most of these cases where the tooth has been replaced at once very good results have followed, in many cases, even when the tooth has been taken entirely from the socket and at once replaced, the pulp has retained its vitality, this has been fully proven to be true by afterwards drilling into the pulp chamber. There are many cases of replantation reported where the tooth has become firm in its socket and remained so for some time, the root then gradually absorbing away until the tooth would drop out. My replantations of teeth after extracting on account of alveolar abscess, phagedenic pericementitis, pyorrhoea alveolaris, or any disease that attacks the peridental membrane to any great extent, will show a very small per centage of success.

By implantation is meant the insertion of a tooth extracted from the alveolar socket of one person and its insertion into a socket mechanically prepared in the alveolus of another.

Implantation can comparatively be called a new operation. It was first performed by Dr. Wm. J. Younger, of San

Francisco, on June 13, 1885, when he implanted four bicuspid for a lady who had worn a plate for thirty years; one year from that time he implanted a molar for the same lady, she having used the bicuspid for one year with perfect satisfaction. Dr. Younger has practised implantation to a larger extent than any other one person up to the present time, although a great many dentists are now bringing the operation into general practice and with as much success as can be expected from any new operation. Some hold that the operation cannot be a permanent one, that in time the tooth will drop out. That may be true, but the same can be said of a gold filling or a crown, or a bridge, or in fact of any step towards the reparation of the natural teeth. Should we say, do not put in gold fillings because they may come out in time? Do not set a crown it may come off in a few years? The facts are equally true in each case. Shall we condemn a poor unfortunate creature to the wearing of that most abominable and equally essential article called a dental plate? or shall we endanger the remaining teeth with a bridge? I say no; it is our duty to restore the mouth to as near the state that nature intended it should be as possible, and that an implanted tooth is nearer to nature than any other method known. I have an implanted tooth in my mouth that was placed there by Dr. Kirk nearly three years ago; from all appearances it is in as good condition now as any time since it was placed there. I can say this for myself, that rather than wear a plate, I would be willing to undergo the operation once a year, but I think the tooth is good for many more years, and when it is gone, providing it does not last as long as the rest of my teeth, I shall have another to replace it. But to the subject. My idea in this paper is to try and make the operation as plain to you as possible.

We will first consider the tooth to be used. As you well know here is the draw-back to implantation, it is next to impossible to find incisors that are in good enough condition to use. Cuspids and bicuspid are more common. If you have and number to choose from get as near the size and shape of the patient's teeth as possible, the age of the tooth (that is, the length of time it has been out of the mouth) has very little to do with the success, providing the pericementum is in proper condition, in fact better results have been derived from teeth that were old and dry than fresh ones. Care should be taken to get as straight roots as possible, the colour does not matter as the tooth will become the same shade as the natural

teeth or so near so that it is impossible to detect the difference without close examination. The tooth should be drilled from the apex of the root and filled with gutta-percha, the end of the root being capped with gold. If the root is too long it should be cut off, but care must be taken that the end is well capped, care should also be taken not to destroy the pericementum any more than possible. The tooth must receive proper antiseptic treatment, and yet care must be taken not to destroy any latent vitality that may be in it.

Dr. Kirk has invented a very valuable apparatus called Kirk's sterilizer in which is used 1 in 500 solution of bichloride of mercury. It is so arranged that the solution reaches a temperature of between 95° and 105° , not above 105° . The tooth is left in the solution for ten or fifteen minutes it is then ready for the socket. In preparing the socket, a 50 per cent. solution of cocaine is injected. The reason that a strong solution is used is because the tissue that is most sensitive is the periosteum, and as that is a very dense tissue very little of the cocaine is taken up, therefore it is necessary to use a strong solution. The needle of the hyperdomic syringe should be pushed well up into the periosteum. The cocaine should be allowed ten minutes to take effect, the incision is made through the gum with a thin and narrow bistoury, there should be one half of a circle of the gum removed with the apex towards the lingual margin, a strong lancet, with round surface is used to dissect the periosteum, you then take a spear pointed drill, with a movable shoulder with which you measure the length of the root of the tooth to be used, and place the shoulder on the drill so that it cannot go deeper into the bone than is wished, as in order to get the power to penetrate the bone it is necessary to use great speed with the engine, and unless a shoulder is used on the drill, much damage might be done. I would say here that the cord engines are the best to use, as their power is much greater than the cable engine; after getting the depth of the socket with the drill you use the Rollin's spiral knives, these consists of different sizes, so that by choosing the right size it will give you nearly the exact shape for your socket, now by trying the tooth in its socket it is easy to tell where it binds, the part should be reamed away with Younger's reamers, these also come in different sizes and cut only with the sides, so that there is no danger from cutting too deep, care must be taken not to cut too much, as the tooth must fit snugly and should be left a little long. After

the socket is prepared, it should be well wiped out to make sure that no fragments of bone are left, and then bathed out with the bichloride solution, the tooth is then pressed or driven well into place. In regard to the retention of the tooth, as the circumstances surrounding have so much to do with the case, it must be left to the judgment of the operator. In many cases where the socket has been made to fit the tooth well and the antagonizing teeth articulate directly upon it, it will not require anything to keep it in place. Again, ligatures are required, and in some cases bands or even plates are necessary. Where ligatures or bands are used, care should be taken that they are kept free from the margin of the gum, as they may cause a source of irritation. In most cases there will be very little soreness following the operation. The patient should be given a small phial of phenol sodique with which to bathe the parts until what little soreness there is departs. It was my intention to give the dangers to be overcome, but have had to cut the paper short for want of time.

FOOLISH USE OF CARBOLIC ACID.—Professor Billroth, of Vienna, warns once more against the imprudent use of carbolic acid, as follows: In the last month four cases have come to my notice where fingers with insignificant wounds have become gangrenous by foolish application of carbolic acid. All those four cases were children whose parents had prescribed a carbolic acid bandage by their own authority, because carbolic acid was said to be good for healing wounds. The use of carbolic acid is much more limited in surgery than heretofore; it is only by degrees we have known the dangers it may present. This remedy may not only cause inflammations and gangrene; it may kill by blood poisoning. Its good qualities are developed only in the hands of a competent physician. I dissuade, most emphatically, the application of carbolic acid without the prescription of a physician. I recommend as the best bandage for fresh wounds acetate of lead (lead-water), which is for sale in all drug stores.—*Pharmaceutische Post.*

British Journal of Dental Science.

LONDON, SEPTEMBER 1st, 1890.

SOME OF THE ADVANTAGES OF OUR PROFESSION.

AT this season of the year how many there are who re-echo Kingsley's sigh of joy, "At last!" as the day comes, when, leaving behind the worries and labours of a practice, they start for the well-earned rest and change. Not then, perhaps, but later, whilst lolling on some soft spot, strolling down some green lane, or lingering in some quiet nook, thoughts wander back to town to those left behind, to their less fortunate fellow-dentists, to other Professional men, still grinding at the mill, to scribblers, whose publishing day comes round with unerring pertinacity, and unconsciously the advantages and disadvantages, which the dental profession offers, will recur to their minds. It has been said, and doubtless with much truth, that the things of this life are, after all, pretty equally divided; that if wealth gives advantages in the attainment of many wishes, it is often the producer of a jaded appetite for some new wonder to relieve the monotony of existence, that it leaves its possessor sighing like Alexander the Great, for new worlds to conquer; that the pleasures of the humbler members of society are quite as, if not more, full of enjoyment than those of their richer brethren. Whether or no, however, this assertion be true, as it affects the broad question relating to the welfare of our common humanity, it is most undoubtedly true, of advantages and disadvantages which the members of our speciality enjoy, when compared with those possessed by the vast bulk of practitioners of medicine in its broader phases. In the ordinary daily routine of general practitioners, there is nothing at all com-

parable to the fatigue produced by some of our long dental operations, neither has the practitioner to remain in one room the whole day long, breathing air contaminated by the expiratory gases, and other products of the patient. Yet though much of a medical man's time is spent in the healthy occupation of driving about in the open air, that is if he be not foolish enough to box himself up in a closed vehicle, the risk of chills from the constant changes of temperature going out and into sick rooms, and the fact that his time can never be fully said to be his own, night or day, certainly have a not inconsiderable counter balancing weight. In the question of holidays the advantages appear to us to be all on the side of the Dental practitioner. For although we are quite prepared to believe that chronic cases form the more lucrative part of a medical practice, yet it cannot be denied that urgent acute ones are those over which most credit may be won. It is of course impossible to foresee these occurring, and any medical man cannot but feel, if he leaves home, it is quite upon the cards that just as his back is turned he is most urgently needed. Now, little as perhaps the general public believe it, acute dental troubles are quite the exception. Not only is it possible for a dentist to arrange his work before leaving, but patients who turn up in his absence, are, in the large majority of cases, quite content to await his return. We know, of course, that both are able to leave *locum tenens* in charge, but a most casual acquaintance with the subject readily shews that whilst the one doing duty for the medical hardly earns his salary, the other does this and a good deal beyond. That the facts are broadly as stated is proved by readiness with which a Dental Surgeon does take his holiday, whilst we certainly know of one or two, and we believe there are many medical men who have not taken a long holiday for years. We believe there is decided good in from time to time thinking over the advantages which our Profession offers. We would not deny to Dentists that right to grumble, which every Englishman considers his birth-right, but we believe, on the whole, if there is cause to grumble, there is also cause for self congratulation.

WE cannot but think that Mr. William Cole has been rather hardly dealt with in the action brought against him at the Liverpool County Court, a report of which will be found on another page. Not only is extraction of a contiguous tooth liable to occur in the hands of even the best operators, and especially of the 2nd molar whilst attempting the 3rd, but extraction of the 2nd molar is quite recognised, in certain cases, as a justifiable step before attempting to remove the wisdom. No good can, however, come of seeking to hide such an accident from the patient; it is far better to be quite open about it. It is not stated whether the plaintiff replaced the tooth after himself removing it; if not, and if we may believe his statement as to valuing it at £50, it would be well to point out to him, that if he had left it alone, the chances were greatly in favour of its having become refixed, and consequently he would have been at least this much in pocket by believing his dentist and leaving the law courts alone.

IN the proceedings of the Royal Society there is an account of Mr. Oldfield Thomas' views on the teeth of *Ornithorhynchus*, which he has recently had an opportunity of studying. His views differ essentially from those of Poulton. He finds that the true teeth are functional for a considerable part of the animal's existence, cutting the gum as is usual, and that after being worn down by friction and by the food and the sand therein contained, they are shed from the mouth as are the milk teeth of other animals. The later cornules or horny teeth, are certainly developed from the epithelium of the mouth cavity, but from that under and around instead of over the teeth, and the hollows in the horny plates are the vestiges of the original alveoli of the teeth, from out of which the latter have been shed. A result of this discovery is that we now have perfect calcified teeth, large enough to be studied with the naked eye, and hence available for comparison with other forms. Neither Oldfield Thomas nor Lydekker and Boulenger, who assisted him, could find any teeth of recent or fossil reptiles or mammals which quite correspond to those of

Ornithorhyncus. He is more and more inclined to believe in the view of Professor E. D. Cope, that the Multituberculata were Monotremes, although the resemblances between the teeth are of the most general character.

THERE are, perhaps, no accidents so sad as those which occur in the holiday season. They bring home to each one of us how near to the brink we have gone, perhaps bathing on the same spot, sailing in the same boat, climbing the same cliff, but the one is taken and the other left. Combe Martin, a little village six miles from Ilfracombe, has been the scene of one of these accidents. A party of five, Charles Day, his two sisters, Parkin, a boatman, and a boy named Hicks, went out in a boat from Watermouth, to sail round the coast; when some distance from the shore, the boat capsized, and all were drowned. Mr. Charles Day was a student at the Charing Cross Hospital and at the Dental Hospital of London, and is said by the teachers to have shown exceptional promises of a distinguished career. We are sure the Profession will extend its sincere sympathy to the bereaved father and mother.

SOME curious practices of malingering among the criminal classes of our great dependency are given in the Times of India, by the writer of a series of articles headed "Bye paths of crime." There are curious instances of chronic dysentery, caused and maintained by taking various irritative drugs, in order that the prisoner may get removed to the hospital. To such an extent is this practice carried, that in some instances life itself is sacrificed.—But the most interesting to us is the artificial production of a pouch in the Pharynx at the level of the epiglottis in order that coins and such like may be hidden therein. This is formed gradually by frequently letting down a leaden bullet to this level, letting it remain a short time and then removing it. In the course of time, six months to two years, quite a little pouch is formed, one is mentioned which would hold ten rupees, that is about ten florins.—In the presidency gaol of Calcutta, there is preserved a leaden bullet three quarters of an inch in diameter, which had been used for this purpose.

A CURIOUS relic of John Hampden, in the shape of one of his teeth has been brought to light by Miss R. M. Forster. She was hunting through an old writing desk, which had belonged to her uncle, and came across a quaint little bag in a secret drawer. In this was an old and battered brass-headed nail, a front tooth and a faded manuscript, a copy of which she sent to the Times. It runs, as follows:—
“This tooth once belonged to John Hampden. I received it when a boy from John Dumelmenger (?), son of the steward of the Earl of Buckinghamshire. On the occasion of the exhumation of Hampden’s body by Lord (?) Nugent who was then writing his life, the said John Dumelmenger (?) was present. The coffin containing his body was left exposed. It remained in this situation a day or two, and those who had access to the church eagerly sought some relic of Hampden. Dumelmenger took some nails from the coffin lid, and with his pocket-knife, as he told me, forced two front teeth from the jaw of the body. One of these he gave to me—this bag contains it—and also a nail from his coffin.

“I was not present when Dumalmenger (?) obtained the tooth, but I lived at Missenden, near Hampden, where he also lived, and where the workman resided who opened the coffin. The whole circumstances were well-known and talked of there, and though ready to suspect imposition even as a boy, I never had any reason to doubt that the tooth once filled the jaw of Hampden, and was obtained in the way described. I had treasured it religiously since I received it except during a period when it was locked up by my mother in her desk. Should it fall into other hands I trust it will be valued and preserved as a relic of a patriot and and hero—of one who fell gloriously on Chaulgrove (*sic*) field in his early days, and on whom the grave has closed more than two centuries.

“JAMES RUMSEY FORSTER.”

“Wellington, New Zealand, Sunday, Sept. 12, 1847.”

Abstracts of British & Foreign Journals.

DENTAL COSMOS.

EXPERIMENTS ON THE COMPARATIVE VALUE OF VARIOUS ANTISEPTICS IN THE TREATMENT OF DISEASED TEETH.

By W. D. MILLER, M.D., D.D.S., Berlin.

WITH the help of my pupil and friend, Carl Yung, I have made up to date 393 separate experiments, on antiseptics of more or less repute.

The object of the experiments was to determine *what antiseptic penetrates pulp-tissue most readily and deepest, and most effectually preserves it from decomposition.*

METHODS OF EXPERIMENTATION.

For convenience of description my experiments may be arranged in five groups, determined by the manner in which the test was carried out. The experiments under Group I. are far advanced, those in Group V are just begun, so that this report will require to be supplemented and probably in some points corrected by another.

Group I.—The first permanent molar of the calf possesses at the time of eruption a pulp about one inch broad and half an inch thick, which divides at a quarter to a half inch from the base into five approximately conical columns which gradually taper toward the crown of the tooth. Four of these columns have a length of one and a quarter to one and a half inches; the fifth is much shorter and smaller. They represent separate centers of dentinification, and may be treated as separate pulps.

Having divided them at the base, we bring them into small glass tubes, flanged at one end and drawn out to a point at the other. Some difficulty will be experienced at first in getting the pulps nicely into the tubes, but anyone may soon overcome this. I tie a fine waxed silk thread around the pointed end of the pulp, moisten the latter with a drop of water, and then thread it into the tube; suction applied to the small end of the tube will also be found very effective.

These pulps are then infected, either at one or both ends or throughout, by bacteria obtained by stirring a number of freshly extracted teeth in a small quantity of water. Finally, the antiseptic to be tested is applied to the pulp at the larger end, covered with cotton, and the tube closed with melted wax. This tube with the pulp is then brought into a test-tube containing nutritive agar-agar, and the point made to extend considerably below the surface of the agar; the tube is then closed with cotton in the ordinary manner, provided with a rubber cap, and placed in the incubator.

Group II.—I made use also of the incisor and cuspid teeth of the calf, not, however, as a rule removing the pulps from the teeth, but simply boring into them from the lingual surface, applying the antiseptic, and closing the opening with wax.

This method did not give as satisfactory results as the former. The large size of these pulps, and particularly the wide foramen, seemed especially to favour the progress of the putrefactive process from the infected part toward the crown, so that the test proved too severe for nearly all of the antiseptics employed, except bichloride of mercury.

Group III.—To overcome the difficulty just referred to, the incisors and cuspids of the calf are extracted and freed from pericementum, and the root elongated by means of a short glass tube. A small opening is then made in the crown to represent an apical foramen and to admit of infecting the pulp. The antiseptic being applied through the glass tube, the whole is placed in a tube of nutritive agar-agar as explained above.

Group IV.—Freshly extracted human teeth whose pulps were not in a state of decomposition were like-wise employed. The cavity was cleansed, the pulp-chamber freely opened, and the antiseptic applied to the pulp, covered with cotton, and the cavity closed with wax; liquids were of course applied on cotton. The further treatment was identical with that explained under Group I.

Group V.—I have just begun to experiment on the teeth of living dogs, but have no results to report at present. These experiments are attended by considerable difficulties, as the animals must be chloroformed at each operation. Cats are equally difficult to work upon, while the teeth of rabbits and guinea-pigs are not suitable for the purpose.

The employment of glass tubes in the manner described under Group I has the great advantage that the action of the

antiseptic, as well as the progress of the putrefaction, is directly visible to the naked eye.

After the preparations had been in the incubator from two days to many weeks, they were removed, the glass tubes cut across or the teeth split open, and the pulps carefully drawn out (their condition being minutely noted) and placed upon the surface of a plate of nutritive agar-agar. If the pulp was in a perfectly aseptic condition, or if it had taken up enough of the antiseptic to exert itself an antiseptic action, no bacteria developed around it; otherwise a portion of it or the whole, depending upon the strength and penetrating power of the antiseptic, would become enveloped in a growth of bacteria. No doubt the stereotyped objection may be made to these experiments that in the human mouth we do not have to treat pulps in glass teeth. Objections of this nature come principally from those who do not experiment themselves.

To a candid mind, however, it will appear that the decomposition of a tooth-pulp must take place in about the same manner in a tube of glass as in one of dentine, and an antiseptic which does not prevent a pulp from putrefying in the former cannot be depended upon for preserving it in the latter. Moreover, the experiments in Groups II to V are free from the glass objection, and finally approach so near to the conditions existing in the mouth that there can be no doubt of their practical value, particularly as the various methods have thus far yielded identical results.

1. *Iodoform.*

Attention has been frequently called to the fact that iodoform is far from possessing the marked antiseptic properties formerly attributed to it. This assertion is fully affirmed by my experiments.

to be in a state of partial decomposition, soft, and stinking; brought upon the culture plate, they very soon became surrounded by a thick, vigorous growth of bacteria, even at the very point where the iodoform had been applied.

It has been maintained that when products of putrefaction come into contact with iodoform iodine is set free, and that, accordingly, in such cases where decomposition has already begun, iodoform is particularly efficient in arresting it. To test the accuracy of this claim a pulp was infected and, after putrefaction had set in, rolled in powdered iodoform and put into a glass tube. After nine days, it was taken out and

placed on an agar-agar plate, where in twenty-four hours it became completely overgrown with masses of bacteria.

I consider iodoform as one of the most worthless substances yet introduced for the purpose of treating the condition under consideration. That this fact has not been revealed by practical experience long ago is in part due to the circumstance that iodoform is nearly always employed in conjunction with some other material, such as carbolic acid, oil of cloves, etc.

2. *Chloride of Lime.*

In two experiments it so completely failed to manifest any retarding action upon the growth of bacteria in the pulps that it was discarded for further experiments.

3. *Peroxide of Hydrogen.*

Pulps treated with peroxide of hydrogen showed signs of putrefaction in from two to eight days, and on opening emitted an exceedingly intense putrefactive odour. On plates of nutritive agar-agar they soon became overgrown with bacteria. This is just what we should expect; this agent brought into contact with the pulp soon decomposes, and becomes then absolutely inert. It may be advantageously employed for cleansing root-canals, but not for preserving non-extricable portions of pulp-tissue against future decomposition.

4. *Sozoiodol Salts.*

The salts of sozoiodol (a derivative of carbolic acid, having the formula $C_6H_4I_2SO_4$) having lately, after the manner of all new antiseptics, received such unlimited praise for their antiseptic, non-poisonous, non-irritating, and altogether desirable qualities, have also begun to be introduced into the dental practice. Pulps treated with the potassium salt (kalium sozoiodolicum) showed no difference from those treated with water. The sodium salt showed a slight action, hardly worthy of consideration.

5. *Bichloride of Mercury.*

Bichloride of mercury in powder, applied to the end of a pulp one and one-half inches long, permeated the whole pulp within forty-eight hours, converting it into a stiff gray mass. Such pulps removed from the tubes at any time from two days to eight weeks were completely preserved, without a trace of smell or any sign of decomposition. In no case did any development take place around the pulps when they were placed on nutritive agar-agar; not only that, but the pulps themselves showed a powerful antiseptic action.

I have no hesitancy in saying that [the bichloride of mercury applied to the pulp in form of powder is by far the most efficient antiseptic which has as yet been employed to any extent in the treatment of the teeth. It however, discolours the teeth, so that it must never in form of powder be applied to the front teeth.

6. *Bichloride of Mercury, Five Per Cent. Solution.*

I was much disappointed in the action of this solution. In glass tubes it permeated and preserved only about one-half of the length of the pulp, leaving the other half to decompose. When the pulps were placed on the plates of agar-agar, they likewise became enveloped at one end in bacteria.

7. *Sulphate of Copper,*

has a powerful penetrative and preservative action. The pulps soon become stiff, light green in colour, and have a sour, metallic smell. Transferred to agar-agar, they mostly remained sterile. Next to bichloride of mercury, it is perhaps the most efficient preservative; unfortunately, it also badly discolours the teeth.

8. *Borax,*

appears to permeate the substance of the pulp very rapidly, but its antiseptic action is correspondingly weak. The majority of pulps treated with it showed evident signs of putrefaction in a very short time, some of them completely liquefying, giving off at the same time an exceedingly disagreeable odour. Occasionally, under application of large doses, they were tolerably well preserved, but on the whole the results were such that I should never think of using it in the treatment of diseased teeth.

9. *Boric Acid,*

was similar to borax.

10. *Ethereal Oils.*

The oils of peppermint, wintergreen, and eucalyptus gave at once results so little encouraging that but few experiments were made. I shall make further tests with them. Oil of cloves appeared somewhat better. The best results, however, were obtained with *oil of cinnamon*. This oil permeates and stiffens the tissue with tolerable rapidity, tinging it various shades of yellow to brown. Pulps treated with it, placed upon the nutritive plates, proved to be sterile in a large measure. I am at present in doubt whether to place the oil of cinnamon on a level with trichlorphenol and carbolic acid.

11. *The Double Cyanide of Mercury and Zinc*
appeared to penetrate the pulp to a distance of one-quarter to one-half an inch. It utterly failed to preserve any considerable portion of the pulp from decomposition.

12. *α - and β -Naphthol*
in concentrated alcoholic solutions, manifested an evident conserving action; it was inferior to that of bichloride of mercury, carbolic acid, oil of cinnamon, etc. I should never think of using these agents in practice.

13. *Hydronaphthol*
showed considerable penetrating, antiseptic, and consequently preservative action. I was not as well pleased with it on the whole as I have been with some other substances. Further experiments with this agent are necessary.

14. *Trichlorphenol*.
Trichlorphenol ($C_6H_2Cl_3OH$), formed by conducting chlorine into carbolic acid (phenol), occurs in form of white crystals, which liquefy at $65^{\circ} C$. It has a strong, irritating odour, but its escharotic action, as far as I have observed by a simple test on the skin, seemed less than that of phenol. Its antiseptic power has been said to be twenty-five times as great as that of phenol. This is very probably a great mistake. It penetrates pulp-tissue very rapidly, thoroughly hardening it and imparting to it a beautiful pink to red colour. It also exerts a powerful antiseptic action, so that in its pulp-preserving property I think I may put it by the side of the sulphate of copper, although carbolic acid, chloride of zinc, and oil of cinnamon will compete with it for the place.

15. *Carbolic Acid (Phenol)*.
Carbolic acid gave results so similar to those obtained with trichlorphenol that they need not be especially described. Its action appears on the whole not quite as powerful as that of trichlorphenol.

16. *Chloride of Zinc*.
Chloride of zinc penetrates the tissue quite as rapidly, and in some cases it has appeared even more rapidly than sublimate. Applied on cotton to the end of a pulp one and a half inches long, it will permeate the whole in forty-eight hours, converting it into a grayish-white stiff body.

Such pulps transferred to the agar-agar plates very seldom showed any development of bacteria, except at the extreme point.

The antiseptic power of the chloric of zinc is, however, known to be inferior to that of many other available antiseptics,

so that, on the whole, I am not yet sure where this agent should be placed on the list.

17. *Thymol and Salicylic Acid*

manifested an evident preservative action upon the dental pulp; it was, however, very decidedly inferior to that of those substances just discussed, and usually confined to a small portion of the pulp. Of the two, thymol gave the better results, though I should not make use of it in practice since we have so much better agents at our disposition.

Basic Aniline Colouring-Matters.

Only two have been tested, *Methylviolet* and *Methyleneblue*. Neither of these substances has the slightest preservative action, nor did they penetrate the pulps to a depth of more than a quarter of an inch. Pulps treated with either the pure substance or with the concentrated alcoholic solution soon showed signs of putrefaction, and became enveloped in a growth of bacteria when transferred to the agar plate.

Campho-phenique.

Has scarcely been tested often enough to form a proper estimate of its value. It appears to penetrate the tissue about as rapidly as carbolic acid, producing a delicate pale colour and moderately hardening the tissue. The pulp also acquires antiseptic properties by the absorption of the solution, but not, as far as my experiments have shown as yet, equal to that imparted to the pulp by carbolic acid alone.

The antiseptics which I have thus far experimented with may accordingly be arranged in the following classes:

1. *Those pre-eminently active in preventing decomposition of pulp-tissue:*

Bichloride of mercury, cyanide of mercury (?), trichlorophenol, sulphate of copper, phenol (carbolic acid), oil of cloves, chloride of zinc, campho-phenique (?), hydronaphthol (?).

2. *Those of doubtful value:*

Thymol, salicylic acid, α - and β -naphthol, acetico-tartrate of aluminium, 5 per cent. solution of bichloride of mercury, and possibly some essential oils.

4. *Those nearly or quite worthless:*

Iodoform, basic aniline colouring-matters, borax, boracic acid, chloride of lime, peroxide of hydrogen, sozoiodol salts, iodol, tincture of iodine, spirits of camphor, naphthaline, the double cyanide of mercury and zinc, and many essential oils.

PHARMACEUTICAL JOURNAL.

OTTO OF ROSE.

THE centre of the production of otto is the region of the Balkan mountains, and includes about 150 villages situated in the two valleys of Toundja and Strema, affluents of the river Maritza. The best is obtained on the southern slope of the Balkans. Here the climate is temperate, but the variations in temperature are sudden and frequent. The ground is sandy and porous, as a rule ; where this is not the case, and water accumulates, roses are killed by the frost, or by fungi which attack the roots. The rose cultivation is divided into a large number of small plots belonging to small proprietors. The dealers although they sometimes buy the flowers and distil the oil, rarely cultivate the roses, and then only to a small extent.

The roses are grown in long plots 100 or 200 metres long, the plants attaining the height of a man. Between the plots a space of $1\frac{1}{2}$ to 2 metres is left, so as to allow the passage of a cart.

Two roses are usually cultivated, a red *Rosa damascena* and a white one *Rosa alba*.

The *Rosa alba* is used as a dividing line between the plantations, and at the end of each plot, so as to present only roses of less value to the peasant, who would steal the more valuable red rose ; it is not used, as a rule, for distillation. Dishonest cultivators, mix it with the red rose, and thus obtain an otto which will bear dilution with Turkish oil of geranium (oil of *Andropogon Schœnanthus*, L.).

The plantations are renewed where required in October or November by making trenches about $\frac{1}{2}$ foot deep and 1 wide, and laying side by side in them suckers with a portion of the underground stem attached. About four or five are placed in a row, the leaves and all being covered with a layer of earth, and then with a thin layer of manure. The young shoots appear in five or six months. In April and June the furrows are weeded. In November the remainder of the earth is returned to the trenches and these are ultimately formed into ridges to better protect the roots.

In May of the second year the trees are about 2 feet high and yield sufficient flowers to pay the expenses of their cultivation up to that date. The next year they are in full bearing and yield the maximum product in five years, although th

plants live twenty years. At ten years of age they are usually cut to the ground, new branches, and even flowers, appearing the next year. The flowers commence to expand between May 20 and 28, and are collected daily till June 15 and 20. Women collect every day at dawn, for an opening flower-bud left till next day will then have lost its fragrance and its colour. The blossoms are placed in a basket carried on the left arm, or in the apron. The fingers become gradually hardened to the spines so that the pricking ceases to be felt, but they become covered with a blackish resinous substance of a terebinthinous odour, and which at the end of the day is scraped off, rolled into little balls, and kept for smoking in cigarettes, it is said to give the tobacco a delicious odour. The contents of the baskets are weighed in the field, paid for and emptied into sacks, which are carried at once to the distillery. If the white roses are present in too large proportion they are paid for separately at a lower price. The stills are usually placed in sheds near the river, for the convenience of obtaining water, and in some places are let by the proprietors at the rate of 4 francs per still. The stills are of copper, and contain 75 litres of water and 10 kilos of flowers. The latter are introduced by means of an osier basket, and the stills are heated with long logs of wood lighted at one end, placed under the still. Then 10 kilos (two flasks) of rose water are distilled over, the fire is removed by withdrawing the burning logs. The still when cool is opened, the contents strained through the osier basket, and the water remaining in the stills saved for the next distillation.

The rose water is then distilled a second time, 40 litres at a time, but only 5 litres are collected. The receivers have the shape of a long necked flask, the water is at first like an emulsion, the oil floating after a time in the neck of the flask. It is removed by inserting a conical tin funnel about two centimetres long, with a slender handle, and having a capillary orifice. It is dipped below the surface of the otto, and when a drop of oil on raising the funnel appears at the orifice it is emptied quickly into a special flask.

About 3000 kilos of flowers are calculated to yield a kilo of otto, and this is the usual yield per hectare, so that a hectare of roses yields a kilo of otto. The adulteration of the otto takes place chiefly by the addition of oil of rose geranium (*Andropogon Schœnanthus*), whereby the congealing point is lowered. The purchaser of otto generally brings with him a basin and thermometer, inserts a flask containing 15 grams

of the essence to be tested. In about three minutes crystalline needles appear, and in ten minutes the otto is solid enough for the uncorked flask to be reversed without spilling a drop. The price varies according to the degree or congealing point that below 12° R. being openly sold at a special rate. The average production of otto of rose in Bulgaria is about 3000 kilos in good years, and 1500 kilos in bad ones.

The peasants are paid according to the season at the rate of .22 to .23 franc per gram for otto of standard purity. The flattened circular metal bottles in which it is exported contain 400 grams, 1 kilo, or 2½ kilos, and the price of the pure essence is 800 to 900 francs per kilo, according to the season.

In Provence the cultivation of the roses is at the present time a flourishing industry, and the otto is considered superior to the Bulgarian. It is obtained from *Rosa centifolia* and sometimes from the yellowish tea rose known as Safrano, which flowers in autumn and winter, but the water is very inferior.

The cultivation of *Rosa centifolia* is carried on chiefly around Grasse, Cannes, Nice, and Valois, by peasant proprietors, who sell the flowers to the distillers in the towns. The roses are grown in little hedges of 0.75 in. high, separated by paths 1 to 1¼ metre wide. The flowers are gathered at the end of April, or about twenty days earlier than in Bulgaria, and the collection lasts twenty to thirty days. The collectors, men and women, commence at dawn, and are paid at the rate of .45 franc per kilogram, the price in bad seasons rising even to 1¾ francs. The chief use of the roses is for making rose pomade, only a small quantity, being distilled for the otto. The flowers are distilled in large stills, such as are generally used for spirit, some holding as much as 150 kilos of flowers. Often one refrigerator receives the condensing pipes of several stills.

Bromine turns pure otto of rose of a green colour, but is itself decolorized by oil of ginger grass, and if a few drops of liquor potassæ are subsequently added, an apple-green precipitate in viscous clots is formed in a colourless liquid, and the odour of roses is not altered; but if adulterated with ginger grass oil a yellow milky precipitate is obtained in a reddish liquid, and a disagreeable odour is given off. This test, however, is qualitative rather than quantitative.

The presence of spermaceti or paraffin in otto is detected in Bulgaria by rubbing the small test bottle of otto between

the hands, containing about 15 grams, when the essence rapidly liquefies, since a temperature of 18° C. suffices, whereas paraffin does not melt till 32°-50° and spermaceti at 46° C., and these remain undissolved at the bottom of the bottle.

With regard to the portion of the flower in which the otto is formed, observations made under the microscope by Dr. Blondel indicated that it is secreted by the epidermal cells. If a section through a petal is immersed in a $\frac{1}{2}$ per cent. solution of osmic acid for about twenty seconds, and then washed in distilled water and mounted in glycerine, the upper and lower epidermis are seen to be the parts distinctly blackened. Other experiments show that these cells also contain fixed fatty matter, since when the petals are distilled until wholly deprived of odour, these epidermal cells are still blackened by osmic acid, and yield to ether a fixed fatty substance. But the fresh petals treated directly with ether, and thus deprived both of fixed oil and essential oil, still show the blackened epidermal cells when treated with osmic acid, but with a bluer tint in them. This is due to tannin, as may be proved on a section of the fresh petal by the use of acetate of iron. When the petals are deprived of their essential oil by distillation, of their tannin by boiling water, and their oil by ether, the epidermal cells no longer become blackened by osmic acid. There is, therefore, every reason to suppose that the chemical changes by which the otto is produced take place in the epidermal cells, or in other words that they are not special receptacles of secretion but secreting cells. The epidermis of the anther does not contain otto, but it is contained in small quantity in that of the filament and on the stigmatic surface and groove, though not in that of the ovary or style.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

THE annual meeting of this Society was held on Tuesday evening, June 3rd, at the Grand Hotel, Mr. Headridge, President, in the chair.

After Mr. Broughton had added a few particulars to the paper which he read at the last meeting, there followed the

DISCUSSION.

Mr. G. G. CAMPION, after referring in complimentary terms to Mr. Broughton's paper, referred to the amount of current taken by the different motors as tested by that gentleman. In Mr. Broughton's experiments the old form of the Cuttriss motor was found to work at a greater speed with a smaller amount of current than any other, and the explanation for that was because it worked with a very short cable. As he understood the matter, the friction of the cable inside the sheath was very great, and as they diminished the length of the cable they diminished the friction. Consequently, with a cable only half the ordinary length, they would get less resistance and, therefore, obtain better results than if they used a long cable. If all the motors had been tested with the short cable which Mr. Broughton had fixed to his own "Cuttris" motor then he (Mr. Campion) imagined the records of the other motors would have been very much greater than they were in comparison. The figures given by Mr. Broughton would be of greater value if the motors tested had all the the same cable and handpiece. He had procured one of the electric lamps used by Mr. Broughton at his demonstration, and had been, so far, extremely pleased with it.

Mr. DOUGAN pointed out that the accumulators only worked sixteen consecutive hours, and he thought it would be very expensive to be continually having the accumulators recharged by the Edison company.

Mr. SIMMS said he would like to emphasise the remarks of Mr. Campion in regard to the experiments which Mr. Broughton had made with different motors ; and which would undoubtedly give different results if the cables were not of the same length. Mr. Broughton's cable was so short that he thought some gentlemen would have great difficulty in using it ; and he was inclined to think that if Mr. Broughton had used one of the usual long cables to his motor it would not have worked satisfactorily. He was surprised that no maker had attempted to modify the "Shaw" arm, and apply it to the motor, as there was undoubtedly less friction than in the cable and sheath. In regard to the accumulators, he thought that gentlemen had not considered what sixteen continuous hours work meant. In ordinary dental practice a four cell accumulator would last about three weeks, and the cost of recharging was one shilling and sixpence. When his present accumulator was being recharged, which occupied about three days, he was obliged to fall back upon his old

engine, which was something he was now averse to doing. Mr. Simms also spoke very highly of the latest "Cuttris" motor, and of the ingenuity which the inventor had displayed in causing the machine to stop automatically when the current was interrupted.

Mr. BROUGHTON, having answered several questions, said he would try his motor with a long cable, and let the members know the result at some future meeting.

The PRESIDENT, in thanking Mr. Broughton for his admirable paper, said he thought it was important that dentists should have some knowledge of electricity, for he believed it would be very much used in the future in dental operations.

CASUAL COMMUNICATIONS.

Mr. SKIPP showed a number of nerve bristles similar to the Donaldson bristle, made in the work room from Piano wire.

Mr. BROUGHTON exhibited a cast of the teeth of a girl sixteen years of age, showing two supernumerary teeth in the maxillary. He also said that, in regard to the copper amalgam spoken of at a former meeting by Mr. Collett, he had discovered a very simple method of obtaining an extremely fine deposit by wrapping wire round the ordinary long wire nails.

Mr. COLLETT said the fine deposit was probably due to a weak solution.

Mr. G. G. CAMPION said he had been advised to make the solution hot, then dip the iron in it for a minute or two, and brush off from it the precipitated copper.

Mr. SKIPP said he had tried that method, and had not found it so successful as using the solution cold.

Mr. SIMMS said that, in regard to the bristles exhibited by Mr. Skipp, Messrs. S. S. White & Co. had recently put on the market bristles without handles, which were less expensive than when supplied with handles.

Mr. COLLETT, Hon. Secretary to the Society, said he had received a letter from Dr. Shaw thanking them, one and all, for their sympathy in his recent bereavement.

Mr. SIMMS, Hon. Secretary to the Council, also pointed out that, owing to this cause, it was not possible to present the Treasurer's annual report that evening. The balloting for the officers for the ensuing year was then proceeded with, when the following were elected.

ELECTION OF OFFICERS.

It was announced that Dr. Shaw declined re-election as Treasurer.

The selection of officers for the ensuing year was then proceeded with, and the following were unanimously elected.

President, Henry Campion.

Vice-Presidents, Parsons Shaw* & John W. Dunkerley.

Treasurer, J. H. Molloy.

Secretary to Council, William Simms.

Secretary to Society, Edward J. Collett.

Librarian, G. G. Campion.

The places of the retiring members of the Council were filled by the election of

A ballot was then taken for three members of the Council in the place of the gentlemen retiring by rotation, when the following were elected :—William Headridge, Thomas Murphey and George Nash Skipp.

When the names of the office bearers for the coming year had been officially announced, the President said that as he was retiring from the position he had held for the last twelve months, they would naturally expect some few words from him. In the first place, he was highly gratified that Mr. Campion had been elected President, for he was a gentleman in whom they had confidence, and was one who had looked well after the good of the Society. Mr. Campion had taken a deep interest in the formation of a library, and it was a proper thing for him to be President during the year in which the scheme would be more fully developed. He was pleased, on looking over the work of the past session, to find how many admirable papers had been produced, and he felt sure he was not stretching the point when he said he thought the work this society had accomplished would compare favourably with that of any similar Society ; and he also thought that the members of the Profession in this part of the country had shown they were entitled to stand with their professional brethren in any part of the world. (Applause.) So long as such scientific and profitable papers were produced, so long would the Society go forward and increase in prosperity. And here he would say that there was a steady increase in their numbers, and the finances were in a highly satisfactory condition. The President concluded by hoping that the members would continue to work

* As Dr. Shaw declined holding any office the coming year, Mr. Thomas Murphy was subsequently elected by the Council a Vice-President in his place.

for the good of the Society, and to extend a mutual helpfulness to one another. (Hearty applause).

Mr. PLANCK moved a vote of thanks, which Mr. G. G. Campion seconded, to the retiring President for the efficient way in which he had carried out the duties of his office during the past year, and to the other retiring officers, which was carried with enthusiasm.

The Ex-President thanked the members very warmly for the vote of thanks to him, and said he should always take a deep interest in the affairs of the society, and do all in his power to aid its work.

A special vote of thanks was also passed to the Hon. Secretaries, and other officers for their services.

After which the proceedings terminated.

Dental News.

Mr. Augustus Winterbottom, F.R.C.S., L.D.S., &c., and Mr. Storer Bennett, F.R.C.S., L.D.S., &c., will respectively at St. George's and at Middlesex Hospital Medical Schools deliver the inaugural addresses at the beginning of the Winter Session, in October. This participation of Dentals in the doings of the great Medical Schools of the metropolis, cannot but be taken as an honour to our profession.

We regret to notice the sudden death of Mr. C. Woodcock, who for many years practised at Pontefract.

We also regret to record an accident to Mr. T. W. F. Stewart, of Tunbridge Wells. He was riding, when the horse was affrighted by a barrel organ, it reared up, and then fell backwards upon its rider. Mr. Stewart's leg was broken, and he sustained other injuries. We are glad to hear he is progressing favourably.

THE SELECT COMMITTEE OF HOSPITALS.

At the Twenty-first meeting,—Dr. Stephen Mackenzie, physician to the London Hospital, said the medical school of the hospital consisted of a number of teachers and lecturers who were appointed by the College Board. That Board was composed jointly of members of the House Committee and of the

staff, each nominating in equal proportions. The number of students at the school on the books was 460. Between £6,000 and £7,000 is the gross income of the school. The working expenses are extremely heavy. He added that 100 guineas was the general fee for the qualifying course, but they had just raised the fee. There was a surplus; but those who worked in the school worked very hard. They divided about £4,600 among the lecturers and paid teachers of the staff. Many of the teachers were men making an income apart from the hospital; they could not subsist upon what they received there. He approved of the system of education at the hospital, and felt there were difficulties in the way of a central medical educational institution. He thought the rotation of the resident staff every six months a good thing for the patients. Fresh men come in with fresh enthusiasm and energies. I think it is a distinct advantage to patients. The hospital itself was not overcrowded; the wards were at times, but that could not be avoided. The London Hospital was as large as any hospital should be to be satisfactorily worked. He thought it would be an enormous disadvantage and very wrong to take away children's departments from general hospitals with medical schools. He was in favour of specialism both in practice and in hospitals. There was room for both special and general hospitals. He wished to emphatically state that the out-patient department was one of the most valuable, if not the most valuable department of general hospitals. The out-patient department should be encouraged in every legitimate way if safe-guarded by a system of inspection. The department should be maintained practically, as at present, although, perhaps it might be a little advantage to have it more consultative. The largest number of patients in the hospital was 733, and the number of beds was 800, so that the hospital as a whole was not overcrowded. As to the nursing he considered it both sufficient and efficient at the London Hospital.

Mr. Munro Scott (the Warden of the Medical College), the next witness, read the rules as to his duties. He had been at the College for 11 years. He was not a medical man.

Mr. Nixon, recalled, stated that it was not possible according to the rules of the hospital for a student to go to and assist at a confinement case without being attended by the resident accoucheur or his assistant. The standing order for guidance of the accoucheur was very precise and was to the

effect that "he shall take care that no pupil shall attend any such case unless accompanied by himself or some one nominated by him."

Mr. Homersham, recalled, said he desired to contradict two statements of Miss Lückes with respect to his father's death and his sister leaving the London Hospital.

Miss Mansel (of the Bloomsbury Nurses' Association) stated that the object of the Association was to nurse the sick poor in their own homes. It was supported by voluntary contributions. As a rule, the patients did not pay. The nurses were all fully trained. The Association had a number of branches in London and different parts of the country. Care was taken that where the nurse was sent the patient was attended to continuously if necessary. From probationers' fees £45 was received.

Mr. A. W. Lacey (secretary of the East London Nursing Society), said that the object of the Society was to nurse the sick poor in their own homes by trained nurses. There were four matrons superintending the nurses who were not ladies. No payments were received from patients, but it was under consideration whether a special nurse should be appointed to attend to paying patients. The nurses had been trained at the general hospitals. As a matter of fact, some patients had made payments, but money had never been asked from them. The Society had a number of voluntary workers, who, under the matron, superintended the nurses, and exercised supervision as to where nurses were most wanted. Sick nurses were sent to the guardians if they wanted them. We should be very glad if these would make us some grant, but the replies we have received have always been in the negative.

Miss Sprigg, assistant-superintendent of the London Association of Nurses, stated that the nurses of the Association were thoroughly trained at the large general hospitals in London and throughout the country. The Association was not a charitable institution, and the charges were from one to four guineas a week.

At the Twenty-second meeting, Mrs. Bedford Fenwick, matron at St. Bartholomew's Hospital 1881 to 1887, said she thought it unfair to the public, the hospitals, and the nurses that a public document like a hospital certificate should be granted in any way at the caprice of an official. Every sister on day and night duty should see and report to the matron daily who should visit the ward once or twice every twenty-four hours. She would advocate a nursing committee or a

nursing school at the hospitals. All cases of serious complaint against nurses should come before such committee. The matron should be empowered by the committee to take probationers on trial, but the regular employment of nurses on the hospital staff should lie in the hands of the committee. The Witness went on to say that each nurse in a general hospital should have three weeks' consecutive holiday in the summer, half a day every week, and three hours off every day. This had always been done at St. Bartholomew's. She believed children are much better treated in a special hospital than in a general hospital, or in a special ward of a general hospital. She urged that registration was most desirable for the protection of the public and the nurses. She did not see why this system, if applied throughout the country, should produce extraordinary embarrassment and difficulty. There would be a sufficient number of trained nurses to supply the country. She did not wish to establish a close corporation of nurses, but that all nurses should come under certain regulations, and have certain powers.

Sir Andrew Clark, the President of the Royal College of Physicians, considered the shutting up of the out-patient department of general hospitals would be the greatest calamity that could happen to the public, and would be most disastrous to the art of medicine. The abuses are as nothing as compared with the advantages of the out-patient departments to the patients, and in a much greater measure to the public at large. He had never had reason to complain of overcrowding in the London Hospital. The nursing in the hospital had greatly improved in his wards, and was quite different to what it was when he first knew the hospital. He was most strongly in favour of general hospitals. Cancer could be much better attended to in general hospitals. He would make an exception in favour of special hospitals for children for lying-in, and for eye disease. As to consumption, he had many doubts. Every general hospital should have a lock ward. He thought the medical education in London was about the most practical education that was given anywhere in the world; it was not perfect, but very nearly so. It would be far better for the schools to unite together and have two or three great centres for the general subjects of education.

Sir Andrew said the public were not sufficient judges of the qualifications necessary for the teachers of medicine and the hospital physician, and were not capable of judging aright

in matters of that kind, and he thought the College of Physicians did for the public that which the public could not do for themselves,—they secured for the public that a man was not only practically qualified, but of good moral character. The profession had succeeded in securing the right of entry and instruction for the medical students in London to the fever hospitals. The witness continuing said he was in favour of some great central board, which should not infringe the autonomy of the hospitals, but which should yet exercise a certain amount of control over them. He would have his body constituted—firstly, by representatives of each hospital; secondly, by representatives from the neighbourhood; and, lastly, by representatives from the Government.

The Committee then adjourned until after the present session.

LEGAL INTELLIGENCE.

ACTION FOR DAMAGES.

At the Liverpool County Court, on the 6th inst., before his Honour Judge Collier and a jury, an action was brought by Mr. George Wright, a clerk, residing, in Dean Road, Liverpool, against Mr. William Henry Cole, dentist, of Bootle, to recover damages for the loss of a tooth. Mr. Rudd appeared for the plaintiff, and Dr. O'Feely (instructed by Mr. H. F. Neale) appeared for the defendant. The plaintiff's case was that, having previously on several occasions visited the defendant for professional services, he did so again on the 31st May, for the purpose of having a wisdom tooth examined, the tooth having caused some trouble. The defendant examined the tooth, and advised its extraction, mentioning, however, that it was likely to break in the course of the operation. The plaintiff decided to have the tooth taken out. The plaintiff sat down in the chair, and the defendant with his forces took out a tooth. The plaintiff supposing something was wrong, and that more had come away than should have done, asked the defendant if he had taken out the wrong tooth. The defendant asked him to sit still, and again putting the forceps into his mouth took out a portion of the wisdom tooth. The plaintiff not being satisfied, again asked if the wrong tooth had not been extracted. The defendant made some reply, and then pressed something into the plaintiff's jaws which caused him great pain. The plaintiff

soon afterwards put his fingers into his mouth, and drew out a sound molar tooth, next to the wisdom tooth, which had evidently been extracted by mistake. The plaintiff asked what defendant meant by pulling out the wrong tooth, and the defendant replied that it was sometimes possible to replant a tooth. The plaintiff, who admitted being somewhat excited, asked the defendant, if he expected to be paid for such work ; to which the defendant replied that he thought not under the circumstances. The plaintiff remarked that he would not have lost the tooth for £50. Shortly afterwards he left the house. The tooth accidentally removed was what was known as a twelve-year molar, and was particularly valuable. The plaintiff, having given evidence in support of the opening, was cross-examined by Dr. O'Feely, and denied being particularly nervous before the operation. Dr. O'Feely, in opening the defendant's case, said the two points for consideration were whether the operation was conducted with professional skill and reasonable carefulness. The defendant was then examined, and agreed that the molar had been extracted by accident, and that, without informing the patient of the accident, he had endeavoured to replant the tooth ; but he explained to the court by means of a model that, owing to the particular formation of the plaintiff's teeth, the accident was one that might easily happen, especially if the patient happened to move his head, as the plaintiff in this case did. The wisdom tooth was much decayed, and far back in the head, and was covered to a great extent by the molar ; and after gripping the wisdom tooth with the forceps, the movement of the plaintiff's head caused the forceps to slip and grip the sound tooth, which was taken out. He denied any negligence, and alleged that accidents of the kind were occasionally encountered. Mr. Pidgeon, of Oriel Road, Bootle, dentist, was called by the defence to give technical evidence. He said he would be extremely surprised if there was a practitioner in the land who had not in his experience had a mishap of the kind, and this without any negligence or lack of skill. He considered the defendant's relation of the facts to be quite reasonable. In the course of the case it was mentioned that the defendant had had great hospital experience, and had taken out something like 5,000 teeth annually for the past few years. The jury found for the plaintiff, damages £5.

British Journal of Dental Science.

No. 544. LONDON, SEPT. 15, 1890. VOL. XXXIII.

ON ENLARGEMENT OF THE SUB-MAXILLARY GLANDS.

By JAMES BAYS, M.D., Lon.

THE question of the cause of the enlargement of the sub-maxillary and internal maxillary lymphatic glands is one which must often present itself to members of the dental profession, and on a correct solution of this, even the life of the patient may depend. The varied source whence lymph is brought to them, and in which any irritative process may lead to their swelling, adds greatly to the difficulty. Thus the lymph stream from the nasal fossæ, the upper part of the pharynx, from the surface of the face, the jaw, and floor of the mouth, empties into these glands. A small patch of contagious impetigo upon the face may thus lead to increase in size of these glands, which may persist after the cause of irritation has been removed. Carious teeth, particularly in children, are undoubtedly fruitful causes of the glandular enlargement, particularly in those with a strumous diathesis. In some cases, dental surgeons are perhaps averse to removing these teeth, when they belong to the first set, from a fear of interfering with the proper development of the jaw and the permanent teeth. But of the two evils, allowing a source of chronic irritation to remain is the greater, for in those children who have already a predisposition to glandular trouble, but little is needed to start a swelling, which may be speedily followed by caseation and suppuration. The source of danger should be removed at once, and an opportunity given for the gland inflammation to subside; if this do not occur within a few weeks, the question of urging the necessity of the removal of the glands presents itself. None who have seen the terrible disfigurement, the irregular, puckered purple scars, resulting from the glands being allowed to take

their own course, or perhaps only being treated with applications of iodine, can doubt the advisability of speedy removal, and this though no definite softening point can be detected, for the glands will often, when cut into, reveal many caseating spots, foci of subsequent suppuration.

Another condition which should be thought of, is the glandular enlargement which forms one of the essential features of lymphadenoma, or Hodgkin's disease, which is particularly apt to occur in the sub-maxillary glands. In the early stages of this complaint, the glands are separate, one from the other, and not till later do they form conglomerations of glands, when they may, if situated in the upper part of the neck, seriously interfere with mastication. In Hodgkin's disease, a waxy pallor of the face and mucous membrane, with the presence of some slight œdema in the subcutaneous tissues of the face are prominent characteristics. In this complaint, the extraction of a tooth should, if possible, be avoided, owing to the great tendency to intractable hæmorrhage, and in this way, the anæmia, already a very serious condition, be rendered worse. It has been found that in some instances the disease has started in those glands which have been adjacent to a source of chronic irritation. Two instances of this are recorded ; in one it followed an abscess under the jaw, while in the other, it occurred after a swelling in the same region which did not suppurate. In the great majority of cases, in their early stage, it is impossible to distinguish the enlargement of the glands due to Hodgkin's disease from that which results from a persistent irritation. Should there be any source discoverable, the presumption is in favour of a simple chronic swelling, but this is not always to be relied upon. At first, in both, the glands are hard, painless, and increase in size but slowly, but while in the inflammatory condition, suppuration often occurs. This is never found in Hodgkin's disease, although they may become fused together, extending beyond the glandular capsules, and infiltrating the surrounding tissues.

Syphilis, that great "*fons et origo mali*," is in some cases responsible for the enlargement of the glands. In this disease, the glands are discrete, each gland being clearly distinguishable from its fellows, showing no tendency to become fused together, or to caseate. They are quite painless, perhaps only a little tender, and of a very marked degree of hardness. This condition results from infection through the face or lips, while if received in the ordinary way, the glands

in the posterior triangle of the neck are the most affected.

Epithelioma of the tongue is generally soon followed by glandular swelling, although this may not be noticed for some months, in most cases, an ulceration with irregular unhealthy looking edges, beginning at the side of the tongue, with an indurated base, will be of an epitheliomatous character, although the question of a syphilitic gumma should be kept in mind, but this will be associated with evidences of the constitutional disease. The glandular swelling at the angle of the jaw, the result of diphtheria has been mistaken for the effect of a local alveolar irritation, the glands in diphtheria are, however, much softer than those due to chronic irritation, and there is considerable infiltration of the surrounding parts. The diagnosis even of diphtheria is not always easy, for in many cases in which the glands are much swollen, the only evident diphtheritic sign is a profuse nasal discharge often of a sanious character, and this should always cause the case to be regarded with considerable suspicion.

OXYPHOSPHATE FILLINGS.

By Dr. OTTOLENGUI.

We have all noticed that what is left on the mixing dish is usually more adherent and harder than what we put into a cavity. These facts depend on circumstances usually absent in the mouth. To make a dense filling the moisture should be excluded for at least twenty-four hours. This may be accomplished by using a coating of chlora-percha over the finished surface of the filling. If the dam is left on until this varnish has hardened by the evaporation of the chloroform it will not wear off for a week, and I have known it to last two months. Such fillings are comparatively permanent. Where we wish to utilize the sticking or cement quality of this material, the best result is obtained by first lightly coating the surfaces with the liquid. This is why the material is so adherent to the slab.

British Journal of Dental Science.

LONDON, SEPTEMBER 1st, 1890.

TO THE STUDENT.

As the years roll round in ever hastening circles, we find ourselves again close upon the commencement of the medical academic year. According to our custom, we publish a guide to the various Medical and Dental Schools, and to other matters of interest to the dental student, and, again in keeping with usage, we purpose here making a few remarks on the more general aspect of the educational influences which a student, joining the hospitals, will find himself surrounded by and which are, at least, within his reach will he but put out his hand to take them. It is to this student that we address ourselves. To him it is all fresh ; to us it may be wearisome, monotonous and of no import. The time we joined the Hospital may be now so far up the hill, down whose gradual slopes Time has carried us so far that it seems but a little pinnacle fading away in the dim distance. Yet still it was the turning point of much—a sudden crisis in our affairs—it was the beginning from which the various stages in our professional career seem to have been evolved in so apparently natural a manner that sequences appear to be, and indeed really are, consequences. We would not for a moment let it be supposed that we undervalued the three years mechanical training that the student should just have finished. We are, on the contrary, eager in our support of the “Pupil System” on all suitable occasions. We, however, take it for granted, seeing that this is a compulsory regulation, that every student has availed himself of the advantages offered, and that

every man who has had one of these students under his care has given him all the instruction that he was able, that he promised to do in the "Articles," and for the performance of which he will hereafter have to certify on the Student's Schedule. We have laboured this point so far because we want to impress on all that it is not a matter of indifference which school a man joins, nor one to be settled by the saving or expenditure of a few pounds, but that it is worthy of long thought. We will enumerate a few considerations. The relative convenience of the Dental and General Hospital, as regards getting from one to the other ; the fitting in of the various lectures ; whether any special facilities are offered to dental students ; the position the hospital holds in the public estimation ; the teaching capacity of those who hold the various lectureships, &c. ; but not the least important point has regard to the time when possibly the student may be seeking an opening for practice either in succession to or in partnership with another, it is the position and number of the past students, for it is a fact that should any senior man need help in his practice, he offers it as a rule to a student of his own Hospital. The question whether a man shall take up the medical qualifications in addition to the dental, is one which we have no space now to argue at length, but if our advice is of weight we should certainly give it in favour of every student doing so. The tendency of the dental curriculum and examinations is towards an approximation with those required of the medical. They have at present so much in common that any man, who can look forward to being able to devote four years to study, should most unquestionably set out with the object of getting both. Nor should he excuse himself from so doing by the fallacious argument, which has of late been pressed, that he had better devote his time to literary studies. We have yet to learn that those who content themselves with the L.D.S. show any higher culture than his doubly qualified brother. Nor should it be forgotten that literary culture is presupposed in a professional man, and its possession, except it be of a very rare order, can hardly therefore be looked upon as any very distinctive

merit. It may be as well to mention here that the Materia Medica and Chemistry Examinations can be passed before a student joins the hospitals, and any one living in a large town, where educational facilities are now so abundant, would do well to do so, for they remove a not inconsiderable burden from the student. It is a moot point whether or no it is wiser to join a General Hospital before joining the Dental. For those going in for the medical also, there are many advantages. He should then have passed the Anatomy and Physiology a year before he presents himself for the L.D.S. examination, thus being able to devote his last year more exclusively to Dental subjects, for he is not called upon to be examined again in Anatomy and Physiology. He would also, when he had passed the L.D.S. be within reasonable distance of attaining his medical qualifications. But after all success or failure will depend on the amount of energy a man throws into his work when he joins the hospital. Too many see the examination yet a long way off, and rest on their oars till their last year, and then have to work all the harder to make up for lost time. A student can make no greater mistake, for not only does he handicap himself when preparing for his pass examination, but he throws away his chances of distinguishing himself in the class examinations. Although no doubt unfortunate, yet we believe that in very many cases the lecturers on dental subjects to a great extent repeat one year what they said the last, so that one set of notes can be filled in and elaborated the second year. It cannot be too much impressed on students that the character and reputation they make at the hospital will stick to them, long after they have left, helping or hindering them, as the case may be. Let them therefore, begin their professional career so that in years to come there will be no room for regret.

Review.

A New theory of Chloroform Syncope, by Robert Kirk, M.D. Ed. & John Thomlinson, Glasgow p. 58.

ANY attempt to explain the cause of chloroform syncope should always be considered with attention by all whose duties cause them to need the use of anæsthetics. The "New Theory" advocated in this little pamphlet the author calculates "must give a violent wrench to pre-conceived opinions, and which will almost certainly be met with opposition from all parties": we must therefore admire his boldness in publishing the theory in question which, in a few words, amounts to this. In addition to the action exercised by the chloroform in the blood, it exerts, according to Dr. Kirk, a direct local influence on the pulmonary mucous membrane. These, he regards, as combining forces, but if the pulmonary influence be suddenly withdrawn before the internal force (chloroform vapour in the blood) is in equilibrium with the external force viz., that on the pulmonary mucous membrane, syncope results.

It seems to us that the author is rather begging the question in assuming the existence of his so-called external force, and though the theory is extremely ingenious it does not carry conviction to us brought up in the old faith regarding the general action of chloroform.

Dental News.

The Annual Picnic of the Manchester Dental Students took place on Thursday, July 24th. The party left the Victoria Dental Hospital by coach at one o'clock, arriving at Prestbury about four, having had a most enjoyable drive. A visit to Mottram Hall was next made, under the guidance of Mr. G. Ream, an old student, after which all partook of a sumptuous repast, which was provided at the "Black Boy Inn," Prestbury. The old church and several objects of antiquity were inspected and the day was brought to a pleasant conclusion by recitations and songs at the "Black Boy." The arrangements were carried out by Messrs. Lingford and Sherratt.

A SENSIBLE DECISION.

Walter Henry Ridge, surgeon dentist, Stafford, sued John Nevitt, accountant, for £15 15s., for services rendered.—Mr. F. Wooley appeared for the plaintiff, and Mr. F. W. Thomson for the defendant.—The plaintiff's case was that plaintiff made defendant a set of teeth in 1883, for which defendant paid him eleven guineas. Plaintiff made him a second set in 1886 but after having them until 1889 he wanted to return them, but did not say they would not fit. Defendant had worn them then for about three years. They were not returned to plaintiff because they did not fit.—Mr. Nevitt, the defendant, said he could not wear them without much pain. He asked plaintiff to remedy them, and he had not worn them for three years.—His Honour said that if the teeth were a reasonable fit there would be an end of the case. He thought it would be better to refer the matter to arbitration. The parties agreed to act upon his Honour's suggestion, and his Honour named Mr. Sims, surgeon dentist, of Manchester, as the arbitrator.

APPOINTMENT.

Robert J. Surman, L.D.S.I. has been appointed Hon. Dental Surgeon to the General Infirmary, Worcester, and also to the Convent of St. Mary, Stanbrook, Worcester.

Dental Hospital Reports.

MONTHLY STATEMENT of operations during July, 1890.

	London.	National.	Manchester.
Patients		1764	1143
Extractions	1673	534	766
„ under Anæsthetics	898	639	173
Gold Fillings	291	127	38
Other Fillings	1082	398	114
Irregularities	74	185	14
Miscellaneous	403	247	392
Artificial Crowns	26	21	3
Total	4447	2151	1560
<i>House</i>	E. PREEDY .		
<i>Surgeons</i>	W. R. BARRETT. E. H. L. BRIAULT.	WM. FISK. A. MCORE.	C.H.SMALE.

QUESTIONS SET AT THE EXAMINATIONS FOR THE DIPLOMA IN DENTAL SURGERY.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

DENTAL ANATOMY AND PHYSIOLOGY AND DENTAL SURGERY.

November 4, 1889. 5 to 8 o'clock, p.m.

N.B.—The Candidate is required to answer at least two of the three questions, both on Dental Anatomy and Physiology, and on Dental Surgery and Pathology.

Dental Anatomy and Physiology.

1. Describe a Carnassial Tooth, giving some of the modifications which it undergoes.

Give an account of the process of Mastication as performed by a typical Carnivore.

2. Describe minutely the process of Absorption of a Deciduous Tooth. How far is it influenced by the proximity of the successional tooth?

3. What is the structure of the earliest calcified layer of Dentine? What explanation of its peculiarities of structure can you offer.

Dental Surgery and Pathology.

1. Describe the physical and microscopical appearances of Dental Caries. What are the modern views as to its nature and causation.

2. Enumerate the various Deodorisers, Disinfectants, and Germicides in general use in Dental Surgery. In what strength and under what conditions would you severally employ them?

3. By what means would you form a diagnosis in a case of Neuralgia, there being in the teeth no cavities except such as have been previously filled?

May 12, 1890. 5 to 8 o'clock, p.m.

Dental Anatomy and Physiology.

1. Which of the Dental Tissues are the more constant? Describe teeth in which one or more of the tissues are absent.

2. Give an account of Enamel-organs, from their first appearance to the completion of their functions. What are the chief modifications of Enamel?

3. What is the special importance of Mastication for the digestion of the several classes of food? Illustrate your remarks by reference to the Herbivora and Carnivora.

Dental Surgery and Pathology.

1. State, giving your reasons, the ages at which you would treat—

(i.) Underhung "bite."

(ii.) Undue protrusion of upper front teeth.

(iii.) Overcrowding of the teeth:—(a) By extraction of the first molar; (b) of the bicuspid; (c) of the lower incisor.

2. Describe the operation of crowning Molars and Bicuspids. Under what circumstances is it advisable?

3. What is the general composition of red, black, and velum rubbers, dental alloy, celluloid, plate-gold, band-gold, gold-solder?

ANATOMY AND PHYSIOLOGY AND SURGERY.

November 4, 1889. 2 to 4 o'clock, p.m.

N.B.—The Candidate is required to answer at least one of the two questions, both on Anatomy and Physiology, and on Surgery and Pathology, unless he is entitled by the Regulations to exemption from any of those subjects.

Anatomy and Physiology.

1. Describe the Course and Distribution of the Lingual and Inferior Dental Nerves (3rd division of 5th Cranial nerve).
2. Describe the act of Deglutition, and mention the muscles by which its successive stages are effected.

Surgery and Pathology.

3. Describe the common forms of Ulcer of the Tongue, with the diagnosis and treatment of each.
4. Give the causes, symptoms, and Treatment of Necrosis of the Jaw.

May 12, 1890. 2 to 4 o'clock, p.m.

Anatomy and Physiology.

1. Describe the Hyoid Bone. Enumerate the Muscles attached to it, and give the nervous supply of each.
2. Explain the terms Syncope, Apnœa, Dyspnœa, and Asphyxia. How is death produced by Asphyxia?

Surgery and Pathology.

3. Describe the principal affections of the Tonsil, with the appropriate treatment of each.
4. Describe the symptoms and treatment of Rheumatoid Arthritis of the Temporo-Maxillary Articulation.

FACULTY OF PHYSICIANS AND SURGEONS
OF GLASGOW.

Nov. 1889.

FIRST DENTAL EXAMINATION.

Section I.—Anatomy.

1. Describe the Ethmoid Bone.
2. Describe the External Pterygoid Muscle.
3. Give the course, Relations, and Branches of the Internal Maxillary Artery.

Section II.—Physiology.

1. What is the cause of the heat of the human body? What its normal temperature, and how is it regulated?
2. What is meant by "nerves of special sense"? Enumerate these, and state their individual functions.

Section III.—Chemistry.

1. What is the difference between a carbo-hydrate and a hydro-carbon?
2. What is chlorine? How is it obtained, and what are its chemical properties?

SECOND DENTAL EXAMINATION.

Section I.—Surgery.

1. Give the symptoms and treatment of a fracture of the base of the skull.

2. Describe fully the operation for ligature of the common carotid artery, and indicate the manner in which the collateral circulation is carried on thereafter.

3. What is epulis? Mention its varieties. State what is known regarding it, and give the treatment.

Section II.—Medicine and Materia Medica.

1. What is opium? Name five different preparations containing it, giving the proportions of opium in each.

2. What diseases affect the gums? Mention the causes, and describe the symptoms and treatment.

Section III.—Dental Anatomy and Physiology.

1. Give a short description of the different modes of attachment of teeth, giving an example of each.

2. Describe the calcification of vaso-dentine, as differing from ordinary hard dentine.

3. Give a physiological explanation of single and double Hare-lip.

Section IV.—Dental Surgery and Pathology.

1. What is Antral abscess—how does it occur in connection with a tooth, and what is the treatment?

2. What conditions are necessary for the origin of dental caries?

3. How would you distinguish between irritation and inflammation of the pulp, and irritation and inflammation of the membrane?

(Answer two questions in each Sections.)

May 1890.

DENTAL LICENCE.—FIRST PART.

(Answer Two Questions in each Section.)

Section I.—Anatomy.

1. Describe fully the palate bone.

2. Give the dissection required to expose the digastric or submaxillary triangle, and enumerate the structures which are contained in it.

3. Give the course and distribution of the third cranial or oculomotor nerve.

Section II.—Physiology.

1. Describe the mechanism of respiration.

2. What foods are "flesh formers" and what "heat formers"? In what states do these pass out of the body?

3. What is the pulse? Why is no pulse felt in the veins?

Section III.—Chemistry.

1. How would you prepare sulphuretted hydrogen and nitrogen? What are their properties?

2. What is meant by "fractional" and what by "destructive" distillation? Give examples.

3. In what condition is gold found in nature? What are its physical properties? Mention some bodies with which it combines.

DENTAL EXAMINATION—SECOND PART.

(Answer two questions in each Section.)

Section I.—Surgery.

1. What is Goitre or Bronchocele? Enumerate the symptoms and give the treatment.

2. State exactly where division of the following Sensory Nerves may be performed, viz. :—

(1) *Supra-orbital*; (2) *Infra-orbital*; and (3) *Mental*.

3. Describe a case of Aneurism of the Third Part of the Subclavian Artery, and give the treatment.

Section II.—Medicine.

1. Mention some morbid conditions of system which exercise an influence in exciting various dental affections.
2. What diseases affect the tooth-pulp? Mention their causes and describe their symptoms and treatment.
3. Classify purgative medicines according to their action; giving one or two examples of each class, with the does.

Section III.—Dental Anatomy and Physiology.

1. State the characteristic features of the Incisors and Molars of the Rodentia.
2. Describe the anatomy of the Temporo-Maxillary Articulation.
3. Describe the process of shedding of the Deciduous Teeth and the microscopic appearance of the absorbing surface.

Section IV.—Dental Surgery and Pathology.

1. From what conditions might pain arise in a recently filled tooth, and how would you deal with it?
2. What is the "Hæmorrhagic Diathesis," and how should it influence your procedure?
3. How would you deal with the conditions resulting from a blow on the mouth with a cricket ball?

ROYAL COLLEGE OF SURGEONS IN IRELAND.

July, 1890.

DENTAL SURGERY.

1. Give treatment of fractured lower maxilla.
2. Describe "Rigg's" Disease, and give the treatment.
3. To what forms of disease are the gums liable? Give the treatment for them.

DENTAL ANATOMY.

1. Give the origin, insertion, and general relations of the masseter muscle,
2. What are the boundaries and contents of the pterygo-maxillary fossa?
3. Describe the malar bone; mention the bones with which it articulates.

MECHANICAL DENTISTRY.

1. The palate of a gold and vulcanite upper is cracked; how will you repair it?
2. Describe how you would take an impression in plaster of Paris of a lower jaw, with six front teeth standing.

DENTAL PHYSIOLOGY.

1. Describe the mechanism by means of which the lower jaw is opened. Mention the fulcrum, power, and resistance.
2. Enumerate the three orders of levers; give an example of each.
3. Describe the method by which a permanent tooth replaces a temporary one.

DENTAL SURGERY.

1. Cystic tumours—causes, symptoms, and treatment.
2. Impacted teeth—causes, symptoms, sequelæ, and treatment.

SURGERY.

1. Enumerate the accidents which might occur in extraction of teeth, and state concisely how you would deal with the more important.
2. Define epulis and describe shortly the different forms.
3. How may malignant ulceration in mouth be distinguished from that resulting from irritation by a sharp stump or small alveolar sequestrum.

British Journal of Dental Science.

DENTAL STUDENTS' SUPPLEMENT.

SEPTEMBER 15TH, 1890.

I.—THE LICENSING CORPORATIONS.

Comparative Summary of Regulations for the License in Dental Surgery.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland	Faculty of Physicians and Surgeons, Glasgow.
I—PRELIMINARY EXAMINATION	Compulsory on all who commenced their Professional Education after July 22nd, 1878. Must be registered as a Dental Student at the office of the General Medical Council, 299, Oxford St., London, W.	Compulsory on all who commenced their Professional Education after July 22, 1878.	Compulsory on all, except those who have passed one equivalent examination.	Compulsory on all who commenced the Professional Education after August 1st, 1878.
2—Age at which the Candidate may present himself	Twenty-one.	Twenty-one.	Any age, but diploma cannot be granted until he is twenty-one.	Twenty-one.
3—DURATION OF PROFESSIONAL EDUCATION	Four years subsequent to registration.	Four years.	Four years.	Four years.
4—COURSES OF LECTURES, &c., to be attended at a recognised School:— Anatomy.....	One Course.	One Winter Course.	One Course.	Two Courses, or one Course and twenty Lectures on Head and Neck.

4—COURSES OF LECTURES &c. (<i>Continued.</i>)—	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
Physiology	One Course.	One Course of 50 Lectures, after 1st Oct. 1890, 1 course of 6 months	One Course.	One Six months' Course.
Surgery	Ditto.	One Winter Course.	Ditto.	Ditto.
Medicine	Ditto.	Ditto.	None.	Ditto.
Chemistry	Instruction.	Ditto.	One Course.	Ditto.
Materia Medica.....	Instruction.	One three months' Course.	Ditto.	One three months' Course.
Dissections and Demonstra- tions, or	} Twelve months.	9 months.; after Oct. 1st, 1890, 12 months.	Two Courses.	Nine months.
Dissections and Anatomy of head and neck ..	}	One Course of 20 Lectures.	One Course.	One Course.
Practical Chemistry and Metallurgy.	Instruction.	One three months' Course.	One Course.	Three Months.
Practice of Surgery, and Clinical Lectures ..	Two Winter Sessions.	One six months' Course.	Two Winter Sessions.	Twenty-four Lectures.
Dental Anatomy and Phy- siology	Two Courses.	One Course.	None.	Twenty Lectures or Demon- strations.
Dental Surgery & Pathology Metallurgy (unless specially included in Practical Che- mistry	Ditto.	Ditto.	Two Courses.	Twelve Lectures.
Dental Mechanics	Ditto.	Ditto.	Two Courses.	Twelve Lectures or Demon- strations.
Practical Instruction in Mechanical Dentistry.....	Three years under a compe- tent Practitioner, all of which may be previous to Registration.	Three years under a Regis- tered Dental Practitioner.	Three years under a Re- gistered Dental Licen- tiate.	Three years under a Regis- tered Practitioner.
Practice of Dental Surgery in a recognised Dental Hospital, or in the Dental Department of a recog- nised General Hospital...	Two years.	Two years.	Nine months.	Two years.
5—FEE	£10 10s over and above stamp duty.	£10 10s.	£10 10s.	£10 10s.

6—LEAST period during which unsuccessful Candidates are referred to their studies	Six months.			Six months.		
7—PARTICULARS OF EXAMINATION		<p>(A) <i>Written.</i> On General Anatomy and Physiology. General Pathology and Surgery.</p> <p>(B) <i>Oral:</i> On all subjects, in the Curriculum. Preparations, Casts and Drawings. Fillings. Cases for Diagnosis, instruments, &c.</p>	<p><i>Written and Oral:</i> First Part—Anatomy, Chemistry, Physiology.</p> <p>Second Part—Surgery, Medicine, Therapeutics, and Special Subjects of Dental Anatomy and Physiology, Dental Surgery, Pathology, and Dental Mechanics. Registered Medical Practitioners are examined on the special subjects only.</p>	<p><i>Written and Oral:</i> On all the subjects of the Curriculum.</p> <p>Preparations, Microscopes, and other appliances.</p>	<p><i>Written, Oral & Practical:</i> 1st Part—Anatomy, Physiology, Chemistry, and Metallurgy.</p> <p>Second Part—Surgery, Medicine, Materia Medica, and special Dental subjects.</p> <p>Practical Examination at a Dental Hospital. Candidates are to bring Examinators. Files and Plugging Instruments.</p>	<p>1890 October 9—11. 1891 April 30—2 May.</p>
8—DATE OF EXAMINATION.	May and November.		<p>I. Professional Examinations Tuesday, April 21, 1891. July 21, 1891.</p> <p>II. "Professional Examinations. Following Thursday.</p>	Quarterly.	<p>Candidates must be registered Dental Practitioners in practice before 1878.</p> <p>Certificates of moral and professional character signed by two Registered Medical Practitioners, and by two Registered Dentists.</p>	
9—MODIFIED CONDITIONS OF ADMISSION TO EXAMINATION <i>sine curricula</i> : (a) Conditions of eligibility.		<p>Candidates must have been in Practice or have commenced Professional Education prior to September, 1859 (the date of the Dental Charter.)</p> <p>One of moral character signed by two members of the College or two Licentiates of the Licensing Bodies in the country where the education was received.</p>				
(b) Conditions, &c., required (<i>continued</i>):						

9—MODIFIED CONDITIONS OF ADMISSION TO EX- AMINATIONS—(contd.): (b) Certificates, &c., re- quired (continued):	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
	<p>Name. Age. Professional address. Date of commencing Dental practice.</p>		<p>Name. Age. Address. Date of commencing practice, and whether such practice has been carried on in conjunc- tion with any other business, and if so with what business.</p>	
	<p>Whether a Member, Li- cenciate or Graduate of any British College of Physicians, College of Surgeons, or Univer- sity, with date of li- cence, &c.</p>		<p>Professional status.</p>	
	<p>Of what learned societies a Member. Whether in Dental prac- tice separately, or if not, in connection with what business. Whether he has employed Advertisements or Pub- lic Notice.</p>		<p>Particulars of Profes- sional Education.</p>	
(c) Manner of Examination	<p>Same as ordinary Exam- ination. Ten guineas over and above stamp duty.</p>		<p>£21.</p>	
For further information apply to Secretary.	<p>MR. F. G. HALLETT, Examination Hall, Vic- toria Embankment, London, W.C.</p>	<p>JAMES ROBERTSON, Solicitor, Clerk to College, 1, George Square, Edinburgh.</p>	<p>G. F. BLAKE, Esq., Royal College of Surgeons, Dublin.</p>	<p>ALEX. DUNCAN, Esq., Faculty of Physicians and Surgeons, Glasgow.</p>

II. PRELIMINARY EXAMINATION.

REGULATIONS OF GENERAL MEDICAL COUNCIL.

No person shall be allowed to be registered as a Medical or Dental Student unless he shall have previously passed (at one or more Examinations) a preliminary Examination in the subjects of General Education as specified in the following List :—

1. English Language, including Grammar and Composition.
2. Latin, including Grammar, Translation from specified authors, and translation of easy passages not taken from such authors.
3. Elements of Mathematics, comprising (*a*) Arithmetic, including Vulgar and Decimal Fractions; (*b*) Algebra, including simple Equations; (*c*) Geometry, including the first Book of Euclid, with easy questions, on the subject matter of the same.
4. Elementary Mechanics of Solids and Fluids, comprising the Elements of Statics, Dynamics, and Hydrostatics.
5. One of the following Optional Subjects :—
 (*a*) Greek; (*b*) French; (*c*) German; (*d*) Italian; (*e*) any other Modern Language; (*f*) Logic; (*g*) Botany; (*h*) Zoology; (*i*) Elementary Chemistry.

List of Examining Bodies whose Examinations fulfil the conditions of the Medical Council as regards Preliminary Education.—

I. UNIVERSITIES IN THE UNITED KINGDOM.

UNIVERSITY OF OXFORD :—

1. Junior Local Examinations: Certificate to include Latin and Mathematics, and also one of the following optional subjects, Greek, French, German.
2. Senior Local Examinations: Certificate to include Latin and Mathematics.
3. Responsions.
4. Moderations.
5. Examinations for a Degree in Arts.

UNIVERSITY OF CAMBRIDGE.

6. Junior Local Examinations; Certificates to include Latin and Mathematics, and also one of the following optional subjects:—Greek, French, German.
7. Senior Local Examinations; Certificate to include Latin and Mathematics.

* * * In the case of Students in Universities with a prolonged curriculum, where the Examination in Mechanics required for their Degree is taken at a more advanced period of study than before commencing Medical Education, Registration can be effected only on having passed the Examination in Mechanics, but their registration may be then antedated to the period at which he Preliminary was passed.

CAMBRIDGE—*Continued.*

8. Higher Local Examinations.
9. Previous Examination.
10. Examination for a Degree in Arts.

UNIVERSITY OF DURHAM :—

11. Examination for Certificate of Proficiency.
12. Examination for Students at the end of their first year.
13. Examination for a Degree in Arts.

UNIVERSITY OF LONDON :—

14. Matriculation Examination.
15. Preliminary Scientific (M.B.) Examination.
16. Examination for a Degree in Arts or Science.

VICTORIA UNIVERSITY :—

17. Preliminary Examination ; Latin to be one of the subjects.
18. Entrance Examinations in Arts, to include all the subjects required.

UNIVERSITY OF EDINBURGH :—

19. Local Examinations (Junior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
20. Local Examination (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
21. Preliminary Examination for graduation in Science or Medicine and Surgery.
22. Examination for a Degree in Arts.

UNIVERSITY OF ABERDEEN :—

23. Local Examinations (Junior Certificate) ; Certificate to include all the subjects required.
24. Local Examinations (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
25. Preliminary Examination for graduation in Medicine or Surgery.
26. Examination for a Degree in Arts.

UNIVERSITY OF GLASGOW :—

27. Local Examinations (Junior Certificate) ; Certificate to include all the subjects required.
28. Local Examination (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following subjects :—Greek, French, German.
29. Preliminary Examination for graduation in Medicine or Surgery.
30. Examination for a Degree in Arts.

UNIVERSITY OF ST. ANDREWS :—

31. Local Examination (Senior Certificate) ; Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—Greek, French, German.
32. Local Examinations (Junior Certificate) ; to include all the subjects required.
33. Preliminary Examination for Graduation in Medicine or Surgery.
34. Examination for a Degree in Arts.

UNIVERSITY OF DUBLIN.

35. Public Entrance Examination.
36. General Examination at end of Senior Freshman year.
37. Examination for a Degree in Arts.

QUEEN'S UNIVERSITY IN IRELAND.

38. Local Examination for Men and Women ; Certificates to include all the subjects required by the General Medical Council.
39. Entrance or Matriculation Examination.
40. Previous Examination for B.A. Degree.
41. Examination for a Degree in Arts.

ROYAL UNIVERSITY OF IRELAND :—

42. Matriculation Examination.

OXFORD AND CAMBRIDGE SCHOOLS' EXAMINATION BOARD :—

43. Certificate, to include the following subjects, an adequate knowledge of English Grammar and Orthography, as shown in the course of the Examination, to the satisfaction of the Examiners, being held as conforming to the requirements of the Medical Council in regard to those subjects :
 - (a) Arithmetic, including Vulgar and Decimal Fractions ;
 - (b) Algebra, including Simple Equations ;
 - (c) Geometry, including the first two books of Euclid ;
 - (d) Latin, including Translation and Grammar ;
 - (e) Also one of these optional subjects, (Greek, French, German.)

II.—OTHER BODIES NAMED IN SCHEDULE (A) TO THE “MEDICAL ACT.”

APOTHECARIES' SOCIETY OF LONDON :—

44. Examination of Arts.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH :—

45. Preliminary (combined) Examination in General Education.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW :—

46. Preliminary Examination in General Education.

ROYAL COLLEGE OF SURGEONS IN IRELAND :—

47. Preliminary Examination ; Certificate to include Mathematics.

III.—EXAMINING BODIES IN THE UNITED KINGDOM NOT INCLUDED IN SCHEDULE (A) TO THE “MEDICAL ACT” (1858).

COLLEGE OF PRECEPTORS:—

- 48 Examination for a First Class Certificate, or Second Class Certificate of First or Second Division, Algebra, Geometry, Latin, and either a modern language, or Greek, or Chemistry, or Botany, or Zoology, having been taken.

QUEEN'S COLLEGE, BELFAST:—

49. Matriculation Examination.

QUEEN'S COLLEGE, CORK:—

50. Matriculation Examination.

QUEEN'S COLLEGE, GALWAY:—

51. Matriculation Examination.

INTERMEDIATE EDUCATION BOARD OF IRELAND:—

- | | |
|------------------------------|--|
| 52. Junior Grade Examination | } Certificate in each case to include all the subjects required. |
| 53. Middle Grade Examination | |
| 54. Senior Grade Examination | |

ST. DAVID'S COLLEGE, LAMPETER:—

55. Responsions Examination, to include all the subjects required.

EDUCATIONAL INSTITUTE OF SCOTLAND:—

56. Preliminary Medical Examination.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN:—

57. Preliminary and Minor Examination (*pro tanto*.)

PHARMACEUTICAL SOCIETY OF IRELAND:—

58. Preliminary Examinations (*pro tanto*).

SCOTCH EDUCATION DEPARTMENT:—

59. Leaving Certificates in each Grade and in Honours.

IV.—CERTAIN EXAMINATIONS OF INDIAN, COLONIAL AND FOREIGN UNIVERSITIES AND COLLEGES.



REGISTRATION OF DENTAL STUDENTS.

Every Dental Student shall be registered in the manner hereinafter prescribed by the General Medical Council.

No Dental Student shall be registered until he has passed a Preliminary Examination, as required by the General Medical Council,* and has produced evidence that he has commenced Dental Study.

The commencement of the course of Professional Study recognised by any of the Qualifying Bodies shall not be reckoned as dating earlier than fifteen days before the date of Registration.

Students who commenced their professional education by apprenticeship to Dentists entitled to be registered, or by attendance upon professional lectures, before July 22nd, 1878 (when Dental Education became compulsory,) shall not be required to produce evidence of having passed a Preliminary Examination.

Pupils who have been articled to their fathers, or to brothers—with whom money transactions would be nominal—shall, in all other respects, be considered to be in the same position in regard to registration as those pupils provided for in the first part of Section 37 of the *Dentists' Act*, who have paid premiums for instruction.

Candidates for a Diploma in Dental Surgery shall produce certificates of having been engaged during four years in Professional Studies, and of having received three years' instruction in Mechanical Dentistry from a registered Practitioner.

One year's *bona-fide* apprenticeship with a registered Dental Practitioner, after being registered as a Dental Student, may be counted as one of the four years of Professional Study.

The three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a Student; but no year of such Mechanical instruction shall be counted as one of the four years of Professional Study unless taken after registration.

The privilege provided by the first Clause of Section 37 of the *Dentists' Act*, for persons whose Articles of Apprenticeship expired before January 1, 1880 shall be extended to all persons whose Articles had begun two years before that period.

* Exception may be made in the case of a Student from any Indian, Colonial, or Foreign University or College, who shall have passed the Matriculation or other equivalent Examination of his University or College, provided such Examination fairly represents a standard of General Education equivalent to that required in this country.

III—EDUCATIONAL BODIES.

LONDON.

DENTAL HOSPITAL OF LONDON, AND LONDON
SCHOOL OF DENTAL SURGERY,
LEICESTER SQUARE.

HOSPITAL STAFF.

Consulting Physician—Sir J. RISDEN BENNETT, M.D., LL.D., F.R.S.

Consulting Surgeon—CHRISTOPHER HEATH, F.R.C.S.

Consulting Dental Surgeons.

SAMUEL CARTWRIGHT, F.R.C.S., L.D.S., SIR JOHN TOMES, F.R.S.
F.R.C.S., L.D.S.

Dental Surgeons.

- 9 a.m.—Monday ... C. E. TRUMAN, M.A, M.R.C.S., L.D.S.
 „ Tuesday ... R. H. WOODHOUSE, M.R.C.S., L.D.S.
 „ Wednesday GEORGE GREGSON, M.R.C.S., L.D.S.
 „ Thursday... STORER BENNETT, L.R.C.P., F.R.C.S., L.D.S.
 „ Friday ... CLAUDE ROGERS, M.R.C.S., L.D.S., D.M.D., Harvard.
 „ Saturday... F. CANTON, L.R.C.P., M.R.C.S., L.D.S.

Assistant Dental Surgeons.

- „ Monday ... LEONARD MATHESON, L.D.S.
 „ Tuesday .. W. HERN, M.R.C.S., L.D.S.
 „ Wednesday E. LLOYD WILLIAMS, L.R.C.P., M.R.C.S., L.D.S.
 „ Thursday... GEO. PARKINSON, M.R.C.S., L.D.S.
 „ Friday ... LAWRENCE READ, L.D.S.
 „ Saturday... W. PATERSON, F.R.C.S., L.D.S.

Administrators of Anæsthetics.

- 9 30 a.m.—Monday ... DUDLEY W. BUXTON, M.D., B.S., M.R.C.P.
 „ Tuesday ... FREDERICK HEWITT, M.D.
 „ Wednesday J. MILLS, M.R.C.S.
 „ Thursday... F. WOODHOUSE BRAINE, F.R.C.S.
 „ Friday ... T. BIRD, M.A., M.R.C.S.
 „ Saturday... G. H. BAILEY, M.R.C.S.

Demonstrators.

CHARLES F. RILOT, M.R.C.S., L.R.C.P., L.D.S.

J. F. COLYER, M.R.C.S., L.R.C.P., L.D.S.

Medical Tutor—H. BALDWIN, M.R.C.S., L.D.S.

3 *House Surgeons* and 2 *Assistant House Surgeons* attend daily.

Demonstrations.—The Medical Officers will make every effort to give Demonstrations on cases selected from time to time, every morning during the Lecture Season: and at the end of the Course those gentlemen who have attended the Demonstrations to the satisfaction of the Medical Officers will be permitted to perform operations at the Hospital under the supervision of the Medical Officers and the House Surgeon.

Dresserships for cases of Extractions.—The appointments are held for two months, and consist of six senior Dresserships for extractions under anæsthetics and eighteen Junior Dresserships for ordinary extractions.

The Senior Dressers will be selected from those pupils only who have entered fully both to the practice and lectures of this Hospital, and also to the Course required by the College of Surgeons for the Licence in Dental Surgery at one of the General Hospitals.

The New Mechanical Laboratory, with seats for 16 men, will be opened in October. The Laboratory is carefully filled with all the requirements of a modern Dental Laboratory, and is lighted with Electric Light for foggy weather. Each bench is also well lighted by first-rate daylight. The workroom is under the superintendence of A. J. WATTS, L.D.S.I., who will attend daily from 9 a.m. to 5 p.m. to give practical instructions to students.

MEDICAL SCHOOL.

The WINTER SESSION will commence on Oct. 1st, 1890.

The SUMMER SESSION will commence in May, 1891.

LECTURES.

Dental Surgery and Pathology,—MR. STORER BENNETT.

Dental Anatomy and Physiology (Human and Comparative), by ARTHUR UNDERWOOD.

MEDICAL TUTOR.

The Medical Tutor attends on four days in the week, from 5 to 7 p.m., for two months previous to two of the Annual Examinations. His classes are open to all Students, and are intended to assist those who are preparing for their examinations at the College of Surgeons; generally speaking, to guide and direct the studies of the pupils, and prepare them in the subjects for the Examinations.

FEES.

GENERAL FEE FOR THE SPECIAL LECTURES REQUIRED BY THE CURRICULUM.

Viz., two Courses on Dental Anatomy, two Courses on Dental Surgery, two courses on Mechanical Dentistry, and one course of Metallurgy, £15 15s.

Fee for the Two Years' Practice of the Hospital required by the Curriculum, £15 15s.

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £31 10s.

Students who perform Operations for Filling Teeth must provide their own Instruments for the same.

Additional Fees for a General Hospital for the two years, to fulfil the requirements of the Curriculum, vary from £40 to £50.

PRIZES.

The Prize-day will in future be held in July.

1. Prizes are awarded by the Lecturers for the best examinations in the subjects of their respective courses, at the end of the Summer and Winter Sessions.

2. Arrangements have been made for a Prize in Operative Dentistry, in the competition for which each candidate is entrusted with the care of a mouth, which he shall, if not impracticable, set thoroughly in order.

3. A prize of the value of five guineas is also given by Messrs. Ash & Sons for the best essay on a surgical subject connected with the mouth.

4. A scholarship of the value of £20 has been founded by Sir Edwin Saunders, and will be awarded to the Student who has obtained the largest number of First Class Prizes during the Winter and Summer Sessions preceding the July in which the award takes place.

Note.—The Medical Committee have resolved "that the holder of the Saunders Scholarship be admitted without additional fee to the extra year of Hospital practice."

The Dean requests that all communications relating to the Medical School may be addressed to him at the Hospital, where he will attend in the afternoons, from Sept. 26th to Oct. 1st, inclusive, from 5 till 5.30 o'clock, or on Wednesday mornings from 10.30 till 12.

MORTON SMALE, M.R.C.S., L.D.S., L.S.A., *Dean*.

NATIONAL DENTAL HOSPITAL AND COLLEGE, GREAT PORTLAND STREET, W.

FOUNDED 1861.

HOSPITAL STAFF.

Consulting Physicians.

B. W. RICHARDSON, M.A., M.D., F.R.S.

W. H. BROADBENT, M.D., F.R.C.P.

Consulting Surgeons.

SIR SPENCER WELLS, BART., F.R.C.S. CHRISTOPHER HEATH, F.R.C.S.

Consulting Dental Surgeon.

SIR EDWIN SAUNDERS, F.R.C.S.

Hon. Visiting Physician.

JAMES MAUGHAN, M.D. &c.,

Hon. Visiting Surgeon.

E. W. ROUGHTON, F.R.C.S., &c.

Dental Surgeons.

Monday ... F. HENRI WEISS, L.D.S., Eng.

Tuesday ... ALFRED SMITH, L.D.S., Eng.

Wednesday ... G. A. WILLIAMS, L.D.S., Eng.

Thursday ... A. F. CANTON, L.D.S., Eng.

Friday ... H. G. READ, M.R.C.S., L.R.C.P., L.D.S.,
L.S.A., D.M.D., Harvard.

Saturday ... W. R. HUMBY, L.D.S., Eng.

Assistant Dental Surgeons.

Monday ... WILLOUGHBY WEISS, L.D.S., Eng.

Tuesday ... R. DENISON PEDLEY, F.R.C.S., Edin.; M.R.C.S.,
L.D.S., Eng.

Wednesday ... MARCUS DAVIS, L.D.S., Eng.

Thursday ... G. READ, L.D.S., Eng.

Friday ... C. W. GLASSINGTON, M.R.C.S., L.D.S., Edin.

Saturday ... W. RUSHTON, L.D.S., Eng.

House Surgeon—W. J. FISK, L.D.S., Edin.

Assistant House Surgeon—A. MOORE.

Assistant Demonstrator—P. WHITE.

Anæsthetists.

HENRY DAVIS, M.R.C.S., L.S.A.

JAMES MAUGHAN, M.D., L.R.C.P., M.R.C.S.

S. E. PEDLEY, M.R.C.S., L.R.C.P., L.D.S., Eng.

SIDNEY SPOKES, M.R.C.S., L.D.S., Edin.

EVERETT NORTON, M.R.C.S., L.S.A.

LECTURES.

Dental Anatomy and Physiology ... SIDNEY SPOKES, M.R.C.S., L.D.S. Edin.

Dental Surgery and Pathology ... WILLOUGHBY WEISS, L.D.S., Eng.

Dental Mechanics ... HARRY ROSE, L.D.S., Eng.

Dental Metallurgy ... W. LAPRAIK, F.I.C., F.C.S.

Operative Dental Surgery ... GEORGE CUNNINGHAM, B.A., D.M.D.,
L.D.S., Eng.

Dental Materia Medica ... C. W. GLASSINGTON, M.R.C.S., L.D.S., Ed.

Elements of Histology ... JAMES MAUGHAN, M.D., L.R.C.P.,

Demonstrator of Dental ... M.R.C.S.

Mechanics ... W. R. HUMBY, L.D.S., Eng.

The hospital is open for the reception of patients every week-day, from 9 o'clock till 11 o'clock a.m. The House Surgeon and Assistant House Surgeon attend daily, from 9 a.m. till 2 o'clock p.m.

Dresserships in the Extraction Room.

These appointments are held for three months by six senior and twelve junior students of the Hospital. The respective dressers for each day are required to be in attendance from 9 o'clock till the conclusion of the practice ; and they will be under the direction of the Dental Surgeons of the day, and of the House Surgeon.

The stopping rooms have accommodation for 20 chairs.

Clinical Lectures and Demonstrations.

Each medical officer will give clinical lectures, when opportune, during the ensuing year. Clinical lectures will also be given from time to time on cases of special interest ; and also demonstrations upon the preparing and filling of cavities and other operations upon the teeth and contiguous parts.

The Hon. visiting Physician and Surgeon give Demonstrations weekly on cases of Oral Surgery, Anæsthetics, Cardiac, and Pulmonary lesions.

Attendance and Examination of Students.

A register is kept of the attendance of students at the Hospital practice and lectures. An attendance of full two years at Hospital practice is required by the College of Surgeons of England ; and no schedule will be signed for any lectures of which less than two-thirds have been attended. Class examinations are held frequently during the several courses, to test the progress and attention of the pupils ; and at the end of each course of lectures a written examination is held. An insufficient attendance at lectures disqualifies the student for receiving any prize of that year.

Tutorial classes are held to prepare for the final examinations, students who have, at this school, complied with the Dental portion of the Curriculum.

LECTURES.

WINTER SESSION, COMMENCING ON MONDAY, Oct. 1st, 1890.

Dental Anatomy and Physiology, by Sidney Spokes, M.R.C.S., L.D.S., Edin. On Tuesdays and Thursdays, at 6 p.m., during October, November, and December.

Operative Dental Surgery, by George Cunningham, B.A., D.M.D., L.D.S., Eng. On Mondays, at 6.30 p.m., during October, November and December. (Free to Students of the Hospital and College.)

Dental Materia Medica and Therapeutics, by Charles W. Glassington, M.R.C.S., L.D.S., Edin. On Tuesdays, at 7.30 p.m. during October, November and December. (Free to students of the College.)

Dental Metallurgy, by W. Lapraik, F.I.C., F.C.S. On Tuesdays at 7.30 p.m., during January, February, and March.

Dental Mechanics, by Harry Rose, L.D.S., Eng. On Mondays, at 7 p.m., during January, February, and March.

Demonstrations on Dental Mechanics, by W. Robinson Humby, L.D.S., Eng. On Wednesdays, at 7 p.m., during January, February, and March. (Free to students of the College.)

SUMMER SESSION, 1891.)

Dental Surgery and Pathology, by Willoughby Weiss, L.D.S., Eng. On Mondays and Thursdays, at 6 p.m., during May, June, and July.

Elements of Histology, by James Maughan, M.D., L.R.C.P., M.R.C.S. On Mondays and Thursdays, at 5 p.m., during May, June, and July. (Free to students of the College.)

FEES.

GENERAL FEE FOR SPECIAL LECTURES REQUIRED BY THE CURRICULUM OF THE ROYAL COLLEGE OF SURGEONS IN ENGLAND: £12 12s.

Fees to single Courses.			One Course,	Two Courses.
Dental Anatomy and Physiology	...	...	£2 12 6	£4 4 0
Dental Surgery and Pathology	...	...	2 12 6	4 4 0
Dental Mechanics	...	...	2 12 6	4 4 0
Dental Metallurgy	...	...	3 3 0	5 5 0

*Operative Dental Surgery	...	...	2	12	6
*Dental Materia Medica	...	...	2	2	0
*Elements of Histology	...	...	1	1	0
*Demonstrations on Dental Mechanics	...	...	1	1	0

Hospital Practice to Registered Practitioners (six months), £7 7s. Ditto (twelve months), £9 9s.

Fee for the two years' Hospital Practice required by the Curriculum, £12 12s. Perpetual Fee, £15 15s.

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £25 4s. Perpetual Fee, £31 10s.

PRIZES.

Six Prizes in Medals, are open for competition among the students of the Colleges, at the end of each Course of Lectures, on the following subjects, viz.: Dental Anatomy, Dental Surgery, Dental Mechanics, Metallurgy, Operative Dental Surgery, and Dental Materia Medica.

Certificates of Honour will be awarded to those Students who show superior proficiency in any of the classes.

The Rymer Gold Medal for General Proficiency, value £5, will be awarded annually to the most distinguished Student of the year. His general conduct and attendance must have been in every respect satisfactory. At the time of the special examination for the Rymer Medal the Student must not hold any qualification. The medal will be awarded on the understanding that the Student completes the Dental Curriculum.

The Ash Prize, value £3 3s. in cash for the best Thesis on a subject in Dental Surgery.

The public Distribution of Prizes will take place during the Winter Session.

F. HENRI WEISS, *Dean*.

GUY'S HOSPITAL.

THE STAFF OF THE DENTAL SCHOOL.

Dental Surgeon—F. NEWLAND-PEDLEY, F.R.C.S., L.D.S.

Senior Assistant Dental Surgeon.

W. A. MAGGS, L.R.C.P., M.R.C.S., L.D.S.

Assistant Dental Surgeons.

J. MANSBRIDGE, L.R.C.P., M.R.C.S.,	G. O. RICHARDS, M.R.C.S., L.D.S.
H. MURRAY, L.D.S.	[L.D.S. R. W. ROUW, L.R.C.P., M.R.C.S.
H. L. PILLIN, L.D.S.	L.D.S.]

Anæsthetists.

F. W. COCK, M.D., M.S.

C. E. SHEPPARD, M.D., B.S.

R. W. LLOYD, L.R.C.P., M.R.C.S.

J. F. SILK, M.D.

LECTURERS.

Dental Surgery.—Mr. NEWLAND-PEDLEY.

Dental Anatomy and Physiology.—Mr. MAGGS.

Operative Dental Surgery.—Mr. MURRAY.

Dental Mechanics.—Mr. RICHARDS.

Metallurgy.—C. E. GROVES, F.R.S.

Anæsthetics.—T. BIRD, M.A., Oxon., M.R.C.S.

DEMONSTRATOR:

Dental Microscopy.—Mr. MANSBRIDGE.

Tutor.—Mr. ROUW.

Dean.—Dr. PERRY.

*These lectures are free to students of the College who have fully entered for the Special Lectures.

FEES.

A Ticket which gives admission to the General and Special Lectures and Demonstrations, and to the Hospital and Dental Practice, requisite for the Diploma in Dental Surgery of the Royal College of Surgeons of England may be obtained :—

1. By the payment of £70 on entrance.
2. By two payments of 40 guineas, and 30 guineas at the beginning of the First and Second Years respectively.

A Ticket which gives admission to the Special Lectures and Demonstrations and Dental Practice only may be obtained for 30 guineas paid on entrance.

The inclusive Fee for Students entering for the M.R.C.S., L.R.C.P., and L.D.S., Eng., is £150 paid in one sum or 150 guineas paid in three annual instalments at the commencement of each academical year :—First Year, £60, Second Year, £60, Third Year, £37 10s.

EDINBURGH.

DENTAL HOSPITAL AND SCHOOLS.

Consulting Physician—ALEX. PEDDIE, M.D., F.R.C.P.E.

Consulting Surgeon—JOSEPH BELL, M.D., F.R.C.S.E.

Consulting Dental Surgeon—JOHN SMITH, M.D., F.R.C.S.E.

Dean and Hon. Treasurer—W. BOWMAN MACLEOD, L.D.S.

Dental Surgeons.

ANDREW WILSON, L.D.S., Edin.

MALCOLM MACGREGOR, L.D.S., Edin.

GEORGE W. WATSON, L.D.S., Edin.

J. STEWART DURWARD, L.D.S., Ed.

JAMES MACKINTOSH.

WILLIAM FORRESTER.

Assistant Dental Surgeons.

JOHN S. AMOORE, L.D.S., Eng.

J. GRAHAM MUNRO, L.D.S., Edin.

FRED. PAGE, L.D.S.

JOHN TURNER, L.D.S., Edin.

DAVID MUNROE, L.D.S., Edin.

THOMAS GREGORY, L.D.S.

Chloroformists.

R. STEWART, M.A., M.B., & C.M.

J. M. FARQUHARSON, M.B., C.M.

W. KEILLER, L.R.C.P. & S., Edin.

DENTAL SCHOOL.

LECTURES.

Dental Anatomy and Physiology (Human and Comparative) by ANDREW WILSON, L.D.S. (Edin.)—These Lectures will be delivered on the evenings of Tuesday and Friday, at 8 o'clock, commencing on 4th November, 1890. The course, consisting of twenty four Lectures, will be illustrated by preparations, models, diagrams, microscopical specimens, etc.

Dental Surgery and Pathology, by GEORGE W. WATSON, L.D.S. (Edin.)—These Lectures will be delivered on the mornings of Tuesday and Friday at 8 o'clock, during the Summer Session, commencing May, 1891. The Course, consisting of twenty-two Lectures, will be illustrated by preparations, models, diagrams, microscopical preparations, etc.

Mechanical Dentistry, by W. BOWMAN MACLEOD, L.D.S. (Edin.)—The Lectures will commence on 12th November, 1890, at 8 p.m., and be continued every Wednesday thereafter till the Course of at least twelve Lectures is concluded.

Practical Mechanics.—Assistant Demonstrators, J. STEWART DURWARD, L.D.S. (Edin.) J. GRAHAM MUNROE, L.D.S. (Edin.)—In addition to the Systematic Lectures, there will be given during the Session, Demonstrations on Dental Mechanics, and each Student will be expected to prepare the mouth, take the impression, make the denture, and insert the same in at least four

cases. Special facilities are afforded in the Mechanical Department; a large and fully equipped workroom under the charge and direction of a competent mechanic, having been set aside for the construction of dental appliances. The Demonstrations will be spread over the two years of Hospital practice, and will be given as occasion serves. Students will require to furnish their own hand tools.

In the various classes prizes will be offered for competition.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.—Hospital Practice, £15 15s. One Course each of Dental Anatomy, Dental Surgery, and Mechanical Dentistry, £9 15s.—£25 10s.

Fees to separate Classes.—Dental Anatomy, Dental Surgery, Mechanical Dentistry, £3 5s. each.

The Hospital Practice and Lectures qualify for the Dental Diploma of the Royal College of Surgeons, Edinburgh, and also for that of the other Licensing Bodies. Second Courses of the Lectures, as required by the Royal College of Surgeons of England, £2 4s.

For further information apply to the Dean, who will be found at the Hospital every Wednesday morning between 9 and 10 o'clock.

THE SESSION 1890-91 OPENS NOVEMBER 1ST, 1890.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.

Hospital Practice, Two Years	£15	15	0
One Course of 24 Lectures in Dental Anatomy ...	}	9	15
„ 22 „ „ Surgery ...			
„ 12 „ „ Mechanics }			

Total.....£25 10 0

For further particulars, apply to the Dean, 5, Lawnston Lane, Edinburgh.

GLASGOW.

DENTAL HOSPITAL AND SCHOOL.

4, CHATHAM PLACE, STIRLING ROAD.

Hon. Consulting Physician.—W. T. GAIRDNER, M.D.

Hon. Consulting Surgeon.—Sir G. H. B. MACLEOD, M.D.

Chloroformists.—Drs. BROWN, CAMPBELL and ANDERSON.

Dental Surgeons.

J. A. BIGGS, L.D.S.

W. S. WOODBURN, L.D.S., F.P.S.G.

REES PRICE, L.D.S., Eng.

J. C. WOODBURN, M.D.

JOHN FOULDS, L.D.S.

W. F. MARTIN, L.D.S.

ALEXANDER WHITE, L.D.S. (Glas.)

W. HOLT WOODBURN, L.D.S.

JAMES CUMMING, L.D.S., Glas.

J. R. BROWNLIE, L.D.S., M.R.C.P., Eng.

JOHN PATERSON GILLESPIE, M.B.C.

W. H. GRAY, L.D.S. [M.]

W. S. WOODBURN, L.D.S.

JAMES CAMERON, L.D.S., (Glas.)

Dental House Surgeon.—

The Hospital is open daily except Sunday, from 5 p.m. till 7 p.m.

The work of the Hospital is conducted as far as possible, by the Students, under the supervision of the Dental Officer of the day. Cases of special interest will be made the subject of clinical instruction or demonstration as they occur.

The practice of the Hospital may be entered upon at any time during the Session, and attendance dated therefrom. Fee for the two years' practice required by the Curriculum, £12 12s. Fee for each course of Lectures, £3 3s.

The Dental Students' Society meets once a month in the Committee Room of the Hospital, when papers on subjects of interest are read and discussed by the Members.

DENTAL SCHOOL.

Dental Anatomy and Physiology, Human and Comparative, by J. COWAN WOODBURN, M.D.

The Lectures will be delivered in the Summer Session, on the mornings of Wednesday and Saturday at 8 a.m., and will be illustrated by Diagrams, Preparations, and Microscopic Specimens. Text-Book—Tomes, Manual of Dental Anatomy, Human and Comparative.

Dental Surgery and Pathology, by JAMES RANKIN BROWNLIE, L.D.S. Eng., M.R.C.S.

Demonstrator J. P. GILLESPIE, M.B.C.M.

These Lectures are delivered on Tuesdays and Thursdays during the months of May and June, at 8 a.m., and will be illustrated by recent Specimens, and other Preparations and Drawings, &c. Text-books—Tomes, Manual of Dental Surgery; Salters' Dental Pathology and Surgery.

Mechanical Dentistry, by J. A. BIGGS, L.D.S.

This course will commence on the first Tuesday of November at 7 p.m., and will consist of 12 Lectures, with Practical Demonstrations in Dental Laboratory.

Dental Metallurgy, by REES PRICE, L.D.S., Eng.

All communications on matters relating to the Dental School should be addressed to the Secretary, D. M. ALEXANDER, Solicitor, 117, Wellington Street, Glasgow, who will forward detailed Prospectus of the School.

BIRMINGHAM.

BIRMINGHAM SCHOOL OF DENTISTRY, QUEEN'S COLLEGE.

The teaching of Dentistry is now undertaken by the Queen's College acting in association with the Birmingham Dental Hospital, and the Birmingham Clinical Board, so that students may fully qualify themselves for the Dental Diplomas of the Royal Colleges.

The Dental Hospital is situated near the College, and is open daily (Sundays excepted). The number of patients treated there during the past year was upwards of 10,000.

The General and Queen's Hospitals offer every advantage for the study of General Surgery and Medicine, the arrangements for which are carried out under the direction of the Birmingham Clinical Board.

LECTURES FOR THE DENTAL CURRICULUM.

WINTER SESSION.

Special Subjects.

Dental Anatomy and Physiology.—J. HUMPHREYS, L.D.S.I., Dental Surgeon to the Dental Hospital. Thursday at 5 p.m.

Dental Surgery and Pathology.—C. SIMS, L.D.S. Eng., consulting Dental Surgeon and Dental Surgeon to the Dental and Queen's Hospitals. Fridays at 5 p.m.

Dental Metallurgy.—W. A. TILDEN, D.Sc., F.R.S. N.B.—This class will be held at Mason's College. About ten lectures on this subject will be given on Tuesdays at 2.30 p.m., from October to Christmas.

General Subjects.

Anatomy, Practical Anatomy, Physiology, Chemistry, Medicine, Surgery. These Classes are similar to those in the Medical Department.

SUMMER SESSION.

Dental Tutor—FRANK H. GOFFE, L.D.S. (Eng. and Ed.)

Special Subjects.

Dental Mechanics.—W. ELLIOTT, L.D.S., Edin, & Dublin, F.C.S. Wednesdays, at 5 p.m.

General Subjects.

Materia Medica and Therapeutics.—*Practical Chemistry*,—These Classes are similar to those in the Medical Department.

FEES.

A Composition Fee of 60 guineas, payable in one sum or in two sums, viz., 40 guineas at the beginning of the first year and 20 guineas at the beginning of the second year of studentship, admits to the full curriculum required for the Dental Diploma (inclusive of the necessary Hospital Practice).

N.B.—Further particulars may be obtained on application to the Warden at the College, or to the Hon. Secretary of the Dental Board, Queen's College, Mr. J. Humphreys.

BIRMINGHAM DENTAL HOSPITAL,

71, NEWHALL STREET.

OPEN DAILY AT NINE A.M.

Hon. Consulting Physician—ROBERT M. SIMON, M.D.*Hon. Consulting Surgeon*—JOHN ST. S. WILDERS, M.R.C.S.*Hon. Consulting Dentists:*

THOMAS R. ENGLISH.

ADAMS PARKER, L.D.S.

CHARLES SIMS, L.D.S.

Hon. Administrators of Anæsthetics:

S. HAYNES, M.B., Ch.M.

FELIX VINRACE, M.D., F.R.C.S.

CHARLES GREENE, M.R.C.S.,

S. WINGFIELD, L.R.C.P., L.R.C.S.

L.R.C.P.

A. GRAY, M.R.C.S.

Hon. Dental Surgeons:

H. BREWARD NEALE, L.D.S.

J. HUMPHREYS, L.D.S.

F. E. HUXLEY, M.R.C.S., L.D.S.

F. W. RICHARDS, L.D.S.

Hon. Assistant Dental Surgeons:

F. H. GOFFE, L.D.S.

WM. PALETHORPE, L.D.S.

W. R. ROBERTS, L.D.S.

Demonstrator in Gold Filling, etc.

W. E. PARROTT, L.D.S.

House Surgeon:

W. S. PARROTT, L.D.S.

DEMONSTRATIONS.

Clinical Demonstrations will be given from time to time by the staff on cases of particular interest; also upon the preparing and filling of cavities and other operations upon the teeth and contiguous structures.

Dresserships in the extraction room for all Students.

Dental Students are required to register their names for Hospital Practice with the Honorary Surgical Secretary, Mr. F. W. Richards, 27, Paradise Street, from whom further information may be obtained.

DENTAL HOSPITAL OF IRELAND,

25, LINCOLN PLACE, DUBLIN.

The WINTER SESSION will commence Monday. October 6th, 1890.

The SUMMER SESSION will commence in May 1890.

Consulting Physicians.

F. R. CRUISE, M.D.

JOHN W. MOORE, M.D.

Consulting Surgeons.

E. H. BENNETT, F.R.C.S.I.

Sir W. STOKES, F.R.C.S.I.

Consulting Dental Surgeons.

R. H. MOORE, F.R.C.S.I.

DANIEL CORBETT, M.R.C.S.E.,

L.D.S., Eng.

Dental Surgeons.

ROBERT HAZELTON, F.R.C.S.I.	DANIEL CORBETT, JUNR., A.B., F.R.C.S.I.
W. BOOTH PEARSALL, F.R.C.S.I.	GEORGE WYCLIFFE YEATES, M.B., Ch.M., L.D.S.I.
R. THEODORE STACK, M.D., F.R.C.S. | D.M.D. (Harv.) L.D.S., Eng. [1.	G. M. P. MURRAY, F.R.C.S.I.
A. W. W. BAKER, M.D., F.R.C.S.I., L.D.S.I.	

Assistant Dental Surgeons.

J. S. THOMSON, L.D.S., Ed.	SHENSTONE BISHOP, L.D.S.I.
----------------------------	----------------------------

Anæsthetists :

CHRISTOPHER GUNN, M.D.	JOHN G. CRONYN, L.R.C.S.I., L.K.Q.C.P.I.
------------------------	---

JOHN R. GRAVES, L.R.C.S.I., L.K.Q.C.P.I.
Pathologist—WILLIAM MALLETT PURSER, M.D.

Registrar—WILLIAM A. SHEA.

In connection with the Dental Hospital of Ireland, the Dental School will be open for the Winter Session on October 6th, 1890.

All Dental Students who have passed their Preliminary Examination are admissible to the Clinical Instruction of the Hospital, after paying Fees and subscribing to the conditions prescribed by the staff.

In addition to Clinical Instruction, Courses of Lectures will be given at the Hospital in Dental Surgery and Pathology, and in Mechanical Dentistry, by R. Theodore Stack, M.D.; A. W. W. Baker, M.D.; W. Booth Pearsall, F.R.C.S.I.; and Daniel Corbett, F.R.C.S.I.; and at the School of Physics which is within a few yards of the Hospital special lectures for Dental Students will be given in Dental Anatomy, and in Metallurgy by Professor Cunningham, and Professor Reynolds.

The Lectures on Dental Surgery and Mechanical Dentistry will be given during the winter, those in Dental Anatomy and Metallurgy during the summer months.

In addition to the longer courses, of Hospital attendance, special courses of three months duration, will be given to Surgeons about to join the Army and Navy, or to practise in the Colonies or remote country districts.

Regulations as to Fees and other conditions are the same that exist at the Dental Hospital of London, Leicester Square. Any further information can be obtained from the Registrar of the Hospital, or

R. THEODORE STACK, Dean.

THE OWENS COLLEGE, MANCHESTER.

DENTAL DEPARTMENT.

- Anatomy*—Professor ALFRED H. YOUNG, M.B., F.R.C.S.
Physiology—Brackenbury Professor WM. STIRLING, M.D., D.Sc.
Medicine—Professor J. E. MORGAN, M.A., M.D., F.R.C.P.,
 Professor JAMES ROSS, M.D. L.D., F.R.C.P.
Surgery—Professor A. W. HARE, M.B., F.R.C.S.E., F.R.S.E.
Clinical Surgery—WALTER WHITEHEAD, F.R.C.S.E.
Chemistry—Professor HAROLD B. DIXON, M.A., F.R.S.
Organic Chemistry—C. SCHORLEMMER, L.D.S., F.R.S.
Materia Medica—Professor D. J. LEECH, M.D., F.R.C.P.
Dental Surgery—G. G. CAMPION, L.D.S.
Dental Anatomy—W. A. HOOTON, L.D.S., L.R.C.P., M.R.C.P.
Dental Mechanics—THOMAS TANNER, L.D.S.
Dental Metallurgy—C. A. BURGHARDT, Ph.D.
Operative Dentistry—Lecturer to be appointed.

The Fee for 2 years' lectures, &c., required by the Dental curriculum of the Colleges of Surgeons is £50 payable in two sums of £25 each at the beginning of the first and second years of studentship.

The 2 years' general Hospital practice is taken at the Royal Infirmary. The fee is £10 10 0, and includes that for attendance on the Lectures on Clinical Surgery.

For further particulars with regard to the Dental Department, application should be made to the Registrar, The Owens College, Manchester.

THE VICTORIA DENTAL HOSPITAL OF MANCHESTER, GROSVENOR STREET, ALL SAINTS.

Consulting Physicians.

SIR WM. ROBERTS, M.D., F.R.C.P.	|	J. E. MORGAN, M.D., F.R.C.P.
HENRY SIMPSON, M.D., M.R.C.S.	|	D. J. LEECH, M.D., F.R.C.P.
D. LLOYD ROBERTS, M.D., F.R.C.P.		

Consulting Surgeons.

E. LUND, F.R.C.S.	|	W. WHITEHEAD, F.R.C.S.
F. A. HEATH, M.R.C.S.	|	T. JONES, F.R.C.S.
J. HARDIE, F.R.C.S.		

Consulting Dental Surgeon.

H. CAMPION, M.R.C.S.	|	PARSONS SHAW, D.D.S.
----------------------	--	----------------------

Dental Surgeons.

Monday Morning—H. PLANCK, L.D.S.I.; J. RENSHAW, L.D.S.I.
Monday Evening—H. C. SMALE, L.D.S. Eng.
Tuesday Morning—T. TANNER, L.D.S. Eng.
Wednesday Morning—J. H. MOLLOY, L.D.S.I.; G. O. WHITTAKER, L.D.S. Eng.
Wednesday Evening—W. DYKES, L.D.S. Glasgow.
Thursday Morning—W. DOUGAN, L.D.S.I.; E. P. COLLETT, L.D.S. Eng.
Friday Morning—G. G. CAMPION, L.D.S. Eng.; W. SIMS, L.D.S.I.
Friday Evening—L. DRESCHFELD, L.D.S.I.; W. HEADRIDGE, L.D.S.I.
Saturday Morning—J. W. DUNKERLEY, L.D.S.I.; W. SMITHARD, L.D.S.I.

Administrators of Anæsthetics:

Wednesday Morning—J. PRINCE STALLARD, M.B.
Saturday Morning—ALEXANDER WILSON, M.R.C.S.

House Dental Surgeon.

A. H. DERWENT, L.D.S. Eng.

The Hospital is situated conveniently for Students about 5 minutes' walk from The Owens College. It contains separate operating rooms devoted respectively to fillings, extractions, and operations under anæsthetics, and is open each morning in the week and on Monday, Wednesday and Friday Evenings.

A Laboratory has recently been opened to afford Students every facility for acquiring manipulative skill in Crown work and Mechanical Dentistry.

Through the generosity of Mr. Fletcher, of Warrington, prizes the value of £20 are competed for annually, and the prizes at the Owens College are also open to Students of the Hospital.

The Fee for the 2 years' Hospital Practice required by the College of Surgeons is £12 12s. For further information apply to

HENRY PLANCK, Dean.

LIVERPOOL.

DENTAL HOSPITAL, MOUNT PLEASANT.

Consulting Physician—THOMAS ROBINSON GLYNN, M.D., M.R.C.P., Lond.

Consulting Surgeon—FRANK T. PAUL, F.R.C.S., Eng.

Consulting Dental Surgeons.

C. ALDER, L.D.S.

H. C. QUINBY, L.D.S., D.D.S.

J. E. ROSE,

W. H. WAITE, L.D.S., D.D.S.

Honorary Dental Surgeons.

R. M. CAPON, L.D.S., Glasg.

E. A. COUNCELL, L.D.S., Eng.

R. EDWARDS, M.R.C.S., L.D.S., Eng.

H. NEWTON HINDLEY, L.D.S., Eng.

W. MAPPLEBECK, L.D.S.I.

W. MATTHEWS, L.D.S., Eng.

THOS. MANSELL, L.D.S., Edin.

J.N.P. NEWTON, L.D.S., Eng. D.D.S.

W. J. PIDGEON, L.D.S., Eng.

M. QUINBY, D.D.S.

J. ROYSTON, L.D.S., Eng.

M. ALEXANDER, L.D.S.I.

Honorary Assistant Dental Surgeon.

E. H. DAVIES, L.D.S.I.

Honorary Demonstrator of Operative Dental Surgery.

R. A. BATES, L.D.S. Eng.

Honorary Chloroformist—H. BIGGS, M.B., F.R.C.S.

Stipendiary Dental Surgeon.

J. NORRIS, L.D.S., Eng.

Registrar.—R. EDWARDS, M.R.C.S., L.D.S., Eng.

This Hospital is a school of Practical Dental Surgery, duly recognised by the Royal College of Surgeons, and open to all Students of Dentistry, under such regulations as shall be determined by the Committee of Management.

The Hospital is open, daily, for the admission of patients from 9 till 11 a.m. and from 6. 30 to 8 p.m., except on Saturdays.

Fees for Hospital Practice. £12 12s. for two years' Hospital Practice required for the curriculum of Students of the Medical Faculty, University College, Liverpool, and Pupils or apprentices of Registered Dentists.

Further information may be obtained by applying to the Honorary Secretary, W. L. JACKSON, Central Buildings, North John Street.

PLYMOUTH.

DENTAL HOSPITAL,

BANK STREET CHAMBERS, BANK STREET, PLYMOUTH.

Physician—C. ALBERT HINGSTON, M.D., Lond.

Surgeons.

CONNELL WHIPPLE, M.R.C.S.

MARCUS H. BULTEEL, M.R.C.S.

Consulting Dentist—FRANCIS H. BALKWILL, L.D.S.E.

Dentists.

ERNEST E. JEWERS, L.D.S.E.

HENRY WILLIAM MAYNE, L.D.S.I.

LOUIS EDWIN SEXTON, L.D.S.E.

JOHN WELLS, L.D.S.I.

A. H. MOUNTFORD, L.D.S.E.

A. TAYLOR, L.D.S.E.

Treasurer—E. A. BENNETT,

The Dentists attend each day, at 9 a.m. except Sundays.

DENTAL SCHOOL.

Certificates of attendance on the practice of this Dental Dispensary are recognised by the College of Surgeons as qualifying for the Diploma in Dental Surgery. The College also recognises the lectures delivered at the Dispensary.

Pupils of any of the Dental Surgeons of the Plymouth Dental Hospital, or other Dentists holding a Diploma of the College of Surgeons, or Member of the Odontological Society, may attend the Hospital on the day of such practitioner as may agree to accept such pupil or pupils, on the payment of £1 1s. per annum to the Institution.

A Course of Lectures will—if a sufficient number of Students present themselves—be delivered during the year.

On "Dental Physiology," by E. E. JEWERS, L.D.S.E.

On "Dental Anatomy" by F. H. BALKWILL, L.D.S.E,

On "Dental Mechanics" by H. W. MAYNE, L.D.S.I.

Fee to Lectures, one Course, £7 7s.

Fee to Lectures, double Course, £12 12s, (required for Diploma.)

Fee to Dental Practice at Hospital, £5 5s. per annum.

Fee to entire Dental Curriculum (required for Diploma), 22 guineas.

E. A. BENNETT, Hon. Sec. and Treasurer.

EXETER.

DENTAL HOSPITAL.

Consulting Surgeons.

A. J. CUMMING, F.R.C.S. Eng.

JAMES BANKART, M.B., Lond., F.R.C.S., Eng.

Consulting Dental Surgeon.

S. BEVAN FOX, L.D.S., Eng.

Dental Surgeons.

J. T. BROWNE-MASON, L.D.S., Eng.

HENRY BIGING MASON, L.D.S., Eng.

T. G. T. GARLAND, L.D.S.I.

J. M. ACKLAND, M.R.C.S., L.D.S.,
Eng.

S. MUNDELL, L.D.S., Eng.

Surgeon Administrators of Anæsthetists.

JOHN MORTIMER, M.B., Lond.

MARTIN L. BROWN, M.D., Ed.

Honorary Secretary.

GEORGE A. TOWNSEND.

Attendance on the practice of this Hospital is recognised by the Royal College of Surgeons of England as qualifying for their Dental Diploma.

The Hospital is open daily (Sundays excepted), and patients are admitted between the hours of 9 and 11 a.m.

Pupils or any member of the Staff or other registered Practitioner (being a Life or Annual Governor) are permitted to attend the practice of the Hospital, subject to the approval of the Medical Sub-Committee, on payment of Five Guineas annually to the Funds of the Institution. Students attending the practice of the Hospital must consider themselves strictly under the control of the Medical Officers, and must not undertake any operation without the consent of the Dental Surgeon for the day.

Numbers of cases treated in 1889, 4938.

DENTAL TUITION.

L.D.S. Examinations "*sine curriculo*," and otherwise, also all preliminary Examinations.

Messrs. Graham and Abbott, Dental Tutors. &c., prepare candidates for above Examination.

Synopsis of subjects taught :—Anatomy, General and Dental Surgery, General and Dental Physiology, Medicine, Chemistry, Dental Materia Medica and Therapeutics, Microscopy, and Metallurgy, Histology and Pathology general and dental. Heat, Magnetism, and Electricity.

Fees and all information, on application to Messrs. Graham & Abbott, 98, Queen St., Exeter.

PRIVATE SCHOOL OF ANATOMY, PHYSIOLOGY AND SURGERY.

And all Professional Subjects.

Demonstrations and Lectures by Mr. Thomas Cooke, F.R.C.S., senior Assistant Surgeon to the Westminster Hospital; and other Masters.

By decision of the Royal Colleges of Physicians and Surgeons, gentlemen rejected at their Anatomical and Physiological Examinations (Primary R.C.S. or Second Conjoint) can get "signed up" from this School for the three or six months' work they are now required to put in before re-examination.

The school meets the requirements of two classes of students, namely :—

I. Students preparing for the usual Primary and Pass Examination of the several Licensing Bodies.

II. Qualified Practitioners and advanced Students, *z. e.*, gentlemen wishing either to obtain some of the Higher Qualifications, or to compete for Appointments in Her Majesty's Army, Navy, and Indian Medical Services. For these, special Classes are provided.

The instruction is given on the dissected and undissected body, with normal and pathological specimens, microscopical preparations, chemical physiological, and surgical apparatus, splints, &c. The operations of Surgery are performed on the dead body. Arrangements can be made for the attendance on midwifery cases, and for practical work in the dispensary.

The school possesses a good collection of physiological apparatus, allowing of the demonstration to the class of the great bulk of the Practical Exercises, in Physiology by Professors Burden-Sanderson, Foster and Langley, and other authors; also chemical apparatus, allowing every student, not only to see, but to repeat for himself, the analysis of the principal food-stuffs, and fluids and solids of the body, and also all the usual reactions, tests, &c. Gentlemen preparing for the Higher Examinations (M.B., Lond., Fellowship of the Royal College of Surgeons) receive special instruction in the more difficult subjects, and have the advantage of personally repeating (with certain restrictions as to the careful use of the physiological apparatus) the practical exercises in Physiology by Professors Burden-Sanderson, Foster and Langley, &c., above alluded to.

A Chemical Laboratory has been provided; and the necessary collections for the practical teaching of Chemistry, Materia Medica, and Pharmacy have been placed in the hands of an experienced teacher of these subjects.

IV.—GENERAL HOSPITALS.

CHARING CROSS HOSPITAL.

Dental Surgeon—J. FAIRBANK, M.R.C.S., *Assistants Dental Surgeon*—J. F. COLYER, M.R.C.S., L.R.C.P., L.D.S., who attend at the Hospital, three days a week, at 9 a.m., for Dental Operations. A course of Lectures on Dental Surgery is also given during January, February, and March.

Two prizes are awarded annually in the class of Lectures on Dental Surgery, of the value of six guineas and four guineas respectively. Dental Students can also compete for the Golding scholarship of £15.

Students may serve as assistants to the Dental Surgeon for a period of three months.

The composition fee for dental students is £66 14s., or 60 guineas, payable in two instalments of 30 guineas each.

Twelve guineas will be deducted from fees paid by instalments, and £12 12s., less 10 per cent., from fees paid in one sum in the case of students who produce certificates on joining the school of previous attendance on chemistry, practical chemistry, and materia medica.

An additional reduction of £5 5s., will be made to dental students not at present requiring practical physiology.

The hours of lectures have been specially arranged to suit the convenience of dental students. Charing-cross Hospital is within three minutes' walk of the Dental Hospital of London.

The Medical School has been considerably enlarged, and, in addition to other improvements, new buildings, including physiological and pathological laboratories, materia medica museum, and anatomical theatre, have been erected. The existing dissecting room and the chemical theatre have also been enlarged.

For further information apply to the Dean, Dr. J. Mitchell Bruce, or to the Librarian and Secretary, Mr. Francis Pink, at the office of the Medical School, Chandos Street, Charing Cross, between the hours of 10 and 4.

LONDON HOSPITAL MEDICAL COLLEGE.

Dental Surgeon—ASHLEY BARRETT, M.B., Lond., M.R.C.S., L.D.S.

The Council of the College of Surgeons recognise the Dental Department of the London Hospital as a school at which may be obtained the Dental Practice necessary to qualify a student for the Examination of the Dental Diploma. Dental Students may obtain the General Medical Education (that is, apart from certain special Lectures to be attended at a Dental School) and

the Dental Practice necessary for the Diploma, at the London Hospital School, on payment of Forty Guineas.

A course of Lectures on the Anatomy and Pathology of the Teeth and Dental Surgery will be delivered by Mr. Ashley Barrett, on days which will be duly announced. It comprises the treatment of Dental Irregularities, of Dental Caries, and such matters in connection with the subject as are of interest to the Medical Practitioner. Mr. Barrett gives practical instruction on Tuesdays at 9 a.m., which is open to all students of the School and Hospital, and can be attended by gentlemen who are not pupils on payment of a fee of Ten Guineas.

In addition to the Lectures a series of Demonstrations of the simpler modes of filling Teeth will be given during the month of June. The Demonstrations will refer to the mode of Manipulating Amalgam and Gutta Percha fillings, the preparation of Cavities, the filling of Teeth containing vital and dead pulps, the mode of relieving pain after filling, and the instruments needed for these operations.

A *Dental Assistant* is elected every three months, without any additional expense. The terms of the office date from the first Tuesday in January, April, July, and October. In selecting Candidates, priority will be given to those who have attended the greatest number of Lectures on Dental Pathology and Surgery, and have also been the most punctual in attendance in the Dental Department on Tuesday mornings.

Further information may be obtained on application to Mr. Munro Scott, the Warden, Medical College, London Hospital.

KING'S COLLEGE, STRAND, W.C.

Special arrangements are made for Dental Students. Apply to the Dean.

MIDDLESEX HOSPITAL.

Consulting Dental Surgeons—SIR J. TOMES, F.R.S., F.R.C.S., L.D.S.

J. S. TURNER, M.R.C.S., L.D.S.

Dental Surgeon—W. STORER BENNETT, F.R.C.S., L.R.C.P., L.D.S.

Assistant Dental Surgeon—W. HERN, M.R.C.S., L.D.S.

In 1887 the acquisition of a site in Cleveland Street enabled a much needed extension of the Buildings to be carried out. The additions included an additional Lecture Theatre, a physiological Laboratory and Class Room, a Student's Room, and a Luncheon Room. A new and commodious Library and a Materia Medica Museum have also been opened.

Students who intend to become Licentiates in Dental Surgery of the Royal College of Surgeons are admitted to attend the requisite courses of Lectures—which are arranged to fit in with the work at the Dental Hospitals—and Hospital Practice on payment of a fee of 40 guineas, in one payment, or by instalments of £30 on entrance, and £15 at the beginning of the Second Winter Session.

A short course of Lectures on Dental Surgery will be delivered during November and December by the Lecturer on Dental Surgery, Mr. Storer Bennett. The Lectures will be supplemented by practical Demonstrations,

which will be given every week during the Winter and Summer Sessions by the Dental Surgeon and Assistant Dental Surgeon. Students of the Hospital free, others pay a fee of 2 guineas.

Further information may be obtained from A. Pierce Gould, F.R.C.S., the Dean, or from the Resident Medical Officer at the Hospital.

ST. GEORGE'S HOSPITAL.

Dental Surgeon—H. L. ALBERT, M.R.C.S.

Mr. Albert attends at the hospital on Mondays and Fridays at 1 p.m.; his assistant on Tuesdays and Saturdays, and at 1 p.m.

A course of Lectures on Dental Surgery is given by Mr. Albert in the Summer Session. Free to Students of the hospital.

Fee for general subjects in Dental Surgery, exclusive of Practical Chemistry, £55. Payable in two instalments; first year, £30; second year, £25.

Further information can be obtained by application to Dr. WHIPHAM, Dean of the Medical School.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.

Dental Surgeons—MR. PATERSON, MR. MACKRELL.

Assistant Dental Surgeons—MR. ACKERY, MR. READ.

The Dental Department of the Hospital is open on Tuesday and Friday mornings at 9 o'clock. The practice of the department is recognised by the Royal College of Surgeons.

The fee for general subjects for Dental Students for the first winter is £33 2s. 6d., for the first summer £33 2s. 6d., or a single payment of £66 3s.

This hospital is the oldest and one of the largest in London, and among many advantages which it offers to the student is that provision is made for their residence in the College, on the recommendation of a medical officer of the Hospital. For the terms of board and residence, and all other information regarding the College, applications should be made, either personally or by letter, to the Warden of the College, Dr. Moore.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.

Dental Surgeon—H. HOWARD HAYWARD, M.R.C.S., L.D.S.

Practical instruction in Dental operations is given on Wednesdays and Saturdays at 9.30 a.m. Dressers are appointed, who hold office for three months. Also a special course of Lectures on Dental Surgery.

Fee for the course, £2 12s. 6d.

For prospectus and further information apply to the School Secretary.

HERBERT W. PAGE, Dean of the School.

ST. THOMAS'S HOSPITAL.

Dental Surgeon—CHARLES EDWIN TRUMAN, M.R.C.S., L.D.S.

Assistant Dental Surgeon—

Gentlemen may receive instruction in diseases of the teeth, are appointed dressers, and can undertake operations, subject to the supervision of the Dental Surgeons, Tuesdays and Fridays at 10 a.m.

Numerous cases of irregularity of the teeth, and the application of artificial appliances, are undertaken during the term.

The fee for attendance on the *general* subjects required of the students in Dental Surgery, is, for the two years, £55 or by instalments, £50 for the first year, and £10 for the second year.

Dental practice, one year, two guineas; perpetual, three guineas.

For further information apply to G. RENDLE, Esq., M.R.C.S., Medical Secretary.

WESTMINSTER HOSPITAL.

Dental Surgeons—J. WALKER, M.D., M.R.C.S., L.D.S., and A. MORTON SMALE, M.R.C.S., L.D.S.

Dr. Walker attends at 9.15 a.m. on Wednesdays, and Mr. Morton Smale on Saturdays at 9.15 a.m., for practical demonstration of diseases and operations on the teeth.

The fee for attendance on the Dental Practice is £2 2s. for three months, and £3 3s. for six months. The whole of the General Lectures and Surgical Practice required for the Dental Diploma of the College of Surgeons can be attended for £48 in one sum on entrance, or for two sums of £30, and £20 payable at the beginning of each year.

Dr. Walker will deliver a course of Lectures on Dental Surgery and Pathology at an hour to be determined at the commencement of the Session.

A scholarship value £20 is offered annually in September for Competition to commencing Dental Students.

SCHOOL OF MEDICINE, SURGEON'S HALL, EDINBURGH.

The fees required for students attending general subjects necessary for the curriculum of the Royal College of Surgeons, Edinburgh, are the same as those for the Conjoint Examining Board, as Candidates for the L.R.C.S.E. require to be in possession of a recognised Diploma in Medicine.

HARVARD UNIVERSITY, DENTAL DEPARTMENT, BOSTON, MASS., U.S.A.

The Sessions of this School begin the last Thursday in September, and end the last Wednesday in June, making nine months of practically continuous work in each year.

General Anatomy, with Dissections, Physiology, and General Chemistry, are the studies of the first year. Of the second year they are Operative and Mechanical Dentistry, Dental Materia Medica and Therapeutics, Oral Surgery, and Surgical Pathology. The Student can also attend gratuitously all the lectures in any other department of the University.

The Infirmary furnishes abundant facilities, averaging 8,000 operations, of which a large proportion consists of filling teeth, every year.

The University degree D.M.D. (*Dentairæ Medicinæ Doctor*) is conferred on all who fulfil the requirements.

The diploma is recognised by the English Medical Council.

For the first year a student is a member of the school, the fee is 200 dols; for the second year, 150 dols: and for any subsequent year, 50 dols.

For further information and catalogues, address, Thomas H. Chandler, Dean, 161, Newbury Street, Boston, Mass., U.S.A.

THE DENTAL COLLEGE OF THE UNIVERSITY OF MICHIGAN.

The Sixteenth Annual Session of this Institution will commence on the 1st of October, and close on the last Wednesday of June, thus making a course of nine months. A preliminary examination, having reference to general educational attainments, is required.

The Student in this department will receive instructions in Anatomy, Physiology, Pathology, Chemistry, Materia Medica, Therapeutics and Surgery, from the professors of their respective branches in the *Departments of Medicine and Surgery* of the University, when lectures commence and continue the same as with the Dental College.

FACULTY OF THE DENTAL DEPARTMENT.

President.

J. B. ANGELL, LL.D.

Principles and Practice of Operative Dentistry.

J. TAFT, M.D., D.D.S.

Anatomy and Physiology.

CORYDON L. FORD, M.D., D.D.S.

Lecturer on Oral Pathology and Dentistry.

J. N. MARTIN, Ph.M., M.D.

Clinical Dentistry.

J. A. WATLING, D.D.S.

Mechanical and Prosthetic Dentistry.

W. H. DORRANCE, D.D.S.

Assistant Professor of Practical Dentistry.

N. S. NOFF, D.D.S.

Demonstrator of Clinical Dentistry.

L. P. HALL, D.D.S.

Special instructions will be given in Dental Pathology, Oral Surgery, Dental Therapeutics, and diseases of Women and Children, with reference to the teeth.

Students should be promptly present at the College on Thursday, September 29th, to make the preliminary arrangements for entering upon regular work.

CONDITIONS OF GRADUATION.

The Candidate must be twenty-one years of age. He must furnish evidence of good moral character.

He must devote three years to the study of his profession. He must attend three full courses of Lectures in the Dental College, or two courses in some College having an equal standard of requirements, and the last one here.

He must sustain an examination satisfactory to the Faculty in all the branches taught.

FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:—

RESIDENTS OF MICHIGAN.—Matriculation, 10.00 dols. Annual dues, 25.00 dols.

NON-RESIDENTS. Matriculation, 25.00 dols. Annual dues, 35.00 dols.

GRADUATION FEE.—For all alike, 10.00 dols. The admission fee is paid but once, and entitles the student to the privilege of permanent membership in any department of the University. The Annual due is paid the first year and every year thereafter while at the University.

For further particulars, address the Dean of the Dental College, Ann Arbor, Mich.—J. TAFT, Dean.

IV.—SCIENTIFIC ASSOCIATIONS.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN. 40, LEICESTER SQUARE.

OFFICERS FOR 1890.

President—FELIX WEISS.

Vice-Presidents.

RESIDENT.

F. CANTON.
J. STOCKEN.
DAVID HEPBURN.

NON-RESIDENT.

J. C. WHEELER (Southsea.)
W. B. MACLEOD (Edinburgh.)
J. H. REDMAN (Brighton.)

Treasurer—THOMAS ARNOLD ROGERS.

Librarian—ASHLEY GIBBINGS.

Curator—STORER BENNETT.

Editor of the Transactions—WALTER COFFIN.

Honorary Secretaries.

E. G. BETTS, (Council.)

J. ACKERY (Society.)

W. A. MAGGS, (For Foreign Correspondence.)

Councillors.

Resident.

R. H. WOODHOUSE.
L. MATHESON.
W. SCOTT THOMSON.
C. S. TOMES, F.R.S.
WILLOUGHBY WEISS.
W. H. WOODRUFF.
W. HERN.
F. NEWLAND-PEDLEY.
C. J. BOYD WALLIS.

Non-Resident.

T. C. PARSONS (Clifton.)
R. T. STACK (Dublin.)
F. J. VANDERPANT, (Kingston-on-Thames.)
M. de C. DICKINSON, (St. Leonards-on-Sea.)
A. A. de LESSERT, (Aberdeen.)
ALEX. FOTHERGILL, (Darlington.)
W. B. BACON, (Tunbridge Wells.)
H. B. MASON, (Exeter.)
MORDAUNT, A. de C. B. STEVENS, (Paris.)

EXTRACTS FROM THE BYE-LAWS.

Objects and Constitution of the Society.

The Society is instituted for the encouragement and diffusion of knowledge in Dental Surgery, and for the promotion of intercourse among members of the Dental Profession.

The Society shall consist of resident, non-resident, corresponding, and honorary members.*

1. The resident members shall consist of gentlemen practising as Dental Surgeons in London or within ten miles of the General Post Office, St. Martins-le-Grand.
2. The non-resident members shall consist of gentlemen practising as Dental Surgeons, residing beyond ten miles from London.
3. The corresponding members shall consist of distinguished gentlemen practising as Dental Surgeons residing in the Colonies of Great Britain or foreign countries.

* The following bye-laws has come into force: "That on and after November 1st, 1882, candidates for the Resident, Non-Resident, or Corresponding Membership of the Society shall not be eligible unless they practise as Dental Surgeons, or are interested in the progress of Dental Surgery, and are also Licentiates in Dental Surgery, or qualified Practitioners of Medicine or Surgery; or possess such a Diploma or Degree as in the opinion of the Council, will qualify them for the Membership of the Society."

4. The honorary members shall consist of distinguished practitioners of Dental Surgery who have retired from practice, of distinguished medical Practitioners, and of gentlemen distinguished in any department of science.

Persons who advertise in the public journals, or by circular, either their profession or their professional attainments or public appointments, or anything relating to their mode of practice or charges, or who expose for public inspection specimens of operative or mechanical Dentistry, or conduct their practice in any way which in the opinion of the Council of this Society, is derogatory to the respectability of the Profession, shall not be considered eligible for nomination as members.

No person being the proprietor of a secret remedy, or holding a patent relating to the requirements of Dental Practice, shall be a member of this Society.

Election and Admission of Resident and Non-Resident Members.

Recommendations for resident members shall be signed by two members from personal knowledge, and by two or more from general knowledge. Recommendations for non-resident members may be signed by one member only from personal knowledge, and by two or more from general knowledge.

All recommendations for resident or non-resident members shall be submitted to, and approved of, by the Council, before being proposed to the Society for ballot.

Contributions of Members.

Every person elected a resident member shall pay three guineas as an admission fee, and an annual subscription of two guineas, *in advance*.

Every person elected a non resident member shall pay two guineas as an admission fee and an annual subscription of one guinea in advance.

The entrance fees and first annual subscriptions shall be paid on admission, and the subsequent annual subscriptions in the month of November in each year; but new members proposed at or after the annual meeting, shall not be required to pay any subscription for the current session.

Ordinary Meetings.

The Ordinary meetings of the Society shall be held on the first Monday in each month, from November to June, both inclusive, at 8 p.m. precisely, except in the month of January.

Each member may introduce two visitors at these meetings on writing the visitors' names in a book to be kept for that purpose. The same visitors will not be admitted more than three times during one season.

Annual General Meeting.

The annual general meeting of the Society for the election of the officers and councillors, &c., shall be held on the evening of the second Monday in January every year.

Society's Transactions.

The transactions of the Society, under the designation of "Transactions of the Odontological Society of Great Britain," shall be printed at such times and in such manner as the Council shall direct.

The "Transactions" shall be presented to all resident and non-resident members of the Society who have paid their annual subscriptions.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND.

5, LAURISTON LANE, EDINBURGH.

President—J. AUSTEN BIGGS, L.D.S.*Vice-Presidents.*

J. MOORE LIPSCOMB, L.D.S., Eng. | G. W. WATSON, L.D.S.

Treasurer—JAMES MACKINTOSH, Esq.*Secretary*—JOHN S. AMOORE, L.D.S., Eng., 7, Abercromby Place.*Curator and Librarian*—J. STEWART DURWARD, L.D.S., Edin.WALTER CAMPBELL, L.D.S., Eng. | W. H. WILLIAMSON, M.D., L.D.S.,
D.D.S.

REES PRICE, L.D.S., Eng. | J. GRAHAM MUNRO, L.D.S.

Ordinary Meetings.—The Society meets on the second Thursdays of November, December, January, February and March.

EXTRACTS FROM THE CONSTITUTION AND LAWS.

Name and Objects.

The Society shall be named the "Odonto-Chirurgical Society," and shall have for its objects the Promotion and Diffusion of Knowledge in matters connected with Dental Surgery; the furtherance of communications on such subjects by Members of the Society; and otherwise to advance the interests of Dental Surgery as a branch of Medicine.

Ordinary and Honorary Members.

The Society shall consist of Ordinary, Honorary, and Corresponding Members.

The Ordinary Members shall consist of Gentlemen practising as Dentists in Great Britain, and of Medical and Surgical Practitioners interested in Dental Surgery.

The Honorary and Corresponding Members shall consist of Gentlemen practising Dentistry in Great Britain, in the Colonies, or in Foreign Countries, and of retired Dental Practitioners in Britain, as well as such Medical or generally Scientific men as may have distinguished themselves in connection with Dental Surgery.

The Ordinary Members shall have vested in them the Government of the Society, and all cases not otherwise specified shall be decided by them by a majority of votes by ballot, if required.

Obligations of Members.

No Member shall be permitted to advertise his profession, his modes of practice, or his charges, either in the public journals or by circular. They shall not be permitted to expose specimens of their work for public inspection, nor to carry on their practice in connection with any other business, nor to hold any patent relating to Dental practice, nor to conduct themselves in any way which the Society may consider derogatory to the Profession, so long as they continue members of the Society. But members who practise in towns other than that in which they reside shall be allowed to intimate their visits: such intimations being subject to the approval of the Council.

Applications for Membership.

Candidates for admission as Members of the Society shall be recommended by an Ordinary Member, and the recommendation seconded by another. After being approved by the Council, such recommendation shall be read to the Society at an Ordinary Meeting, and shall lie over to the next, when the Candidate shall be balloted for, when two-thirds of the Members present must be in his favour to secure his election.

Contributions.

Ordinary Members residing within a ten-mile radius of the City shall pay an Entrance Fee of One Guinea, and One Guinea of an Annual Subscription in advance. All other Ordinary Members shall pay an Entrance Fee of One Guinea, and Ten Shillings and Sixpence of an Annual Subscription. All Annual Subscriptions to date from the 1st March preceding the Candidate's admission.

THE BRITISH DENTAL ASSOCIATION.

(Incorporated June 3rd, 1880.)

40, LEICESTER SQUARE, LONDON.

President—J. T. BROWNE MASON, L.D.S., Eng.*President-Elect*—J. SMITH TURNER, M.R.C.S., L.D.S. Eng.*Vice-Presidents.*SIR EDWIN SAUNDERS, F.R.C.S.
DR. JOHN SMITH, F.R.C.S., Edin.SIR JOHN TOMES, F.R.S., F.R.C.S.,
L.D.S., Eng.*Treasurer*—W. H. WOODRUFF, L.D.S., Eng.*Representative Board.**President*—FREDK. CANTON, M.R.C.S., L.R.C.P., L.S.A., L.D.S., Eng.*Vice-President*—W. BOWMAN MACLEOD, L.D.S., Edin.*For London.*L. MATHESON, L.D.S., Eng.
S. J. HUTCHINSON, M.R.C.S., L.D.S.,
Eng.
C. S. TOMES, F.R.S., M.A., Oxon,
M.R.C.S., L.D.S., Eng.
MORTON SMALE, M.R.C.S., L.S.A.,
L.D.S. Eng.
F. HENRI WEISS, L.D.S., Eng.
J. ACKERY, M.R.C.S., L.D.S., Eng.E. LLOYD WILLIAMS, L.R.C.P.,
M.R.C.S., L.S.A., L.D.S., Eng.
W. H. COFFIN.
J. FAIRBANK, M.R.C.S.
W. HERN, M.R.C.S., L.D.S., Eng.
A. J. WOODHOUSE, L.D.S., Eng.
D. HEPBURN, L.D.S., Eng.
SYDNEY SPOKES, M.R.C.S., L.D.S.,
Eng.*For the Provinces.*J. M. ACKLAND, M.R.C.S., L.D.S.,
Eng. Exeter.
J. A. BIGGS, L.D.S., Glas. Glasgow.
G. G. CAMPION, L.D.S., Eng.
Manchester.
J. DENNANT, L.D.S., Eng. Brighton.
W. CAMPBELL, L.D.S., Eng., Dundee.
J. FOTHERGILL, M.R.C.S., L.D.S.,
Eng., D.D.S., Penn., Darlington.
W. H. B. NEALE, L.D.S.I., Birming-
ham.
J. H. REDMAN, L.D.S.I., D.D.S.,
Phil., Brighton.
R. P. STACK, L.D.S., Eng., M.D.,
Dub., F.R.C.S.I., D.M.D.E. APPERLY, L.D.S., Eng., Stroud.
J. R. BROWNIE, L.D.S., Eng., Glas-
gow.
J. CORNELIUS WHEELER, Southsea.
G. CUNNINGHAM, B.A., Cantab.,
D.M.D., L.D.S., Eng., Cam-
bridge.
E. L. DUDLEY, L.D.S., Eng., Bath.
W. E. HARDING, L.D.S., Eng.
Shrewsbury.
T. E. KING, L.D.S., Eng., York.
R. P. LENNOX, Cambridge.
C. SIMS, L.D.S., Eng., Birmingham.*Ex-Officio Members.*H. C. QUINBY, L.D.S.I., *President*.
J. RENSHAW, L.D.S.I., *Hon. Sec.*

} Midland Counties Branch.

J. C. OLIVER, L.D.S.I., <i>President</i> ,	}	Western Counties Branch.
H. B. MASON, L.D.S., Eng., <i>Hon. Sec.</i>		
AMOS KIRBY, L.D.S., <i>President</i> .	}	Eastern Counties Branch.
W. A. RHODES, L.D.S.I., <i>Hon. Sec.</i>		
ROBERT REID, L.D.S., Edin., <i>President</i> .	}	Scottish Branch.
W. B. MACLEOD, L.D.S., Edin., <i>Hon. Sec.</i>		
J. MOORE LIPSCOMB, L.D.S., Eng. <i>President</i> .	}	West of Scotland Branch.
REES PRICE, L.D.S., <i>Hon. Sec.</i>		
R. F. H. KING, L.D.S., Eng., <i>President</i> .	}	Central Counties Branch.
W. PALETHORPE, L.D.S., Eng., <i>Hon. Sec.</i>		
F. J. VANDERPANT, L.D.S.I., <i>President</i> ,	}	Southern Counties Branch.
M. HUGHES, M.R.C.S., L.D.S. Eng. <i>Hon. Sec.</i>		
J. C. CLARKE, L.D.S. Eng., <i>President</i> .	}	Irish Branch.
W. B. PEARSALL, F.R.C.S.I., <i>Hon. Sec.</i>		
W. B. PATERSON, F.R.C.S., L.D.S., Eng. <i>Hon. Secretary</i> .		

Extracts from Memorandum of Association and Bye-laws.

The objects for which the Association is established are the promotion of Dental and the allied Sciences, and the maintenance of the honour and the interests of the Dental Profession by

“The Periodical meetings of the Members of the Association and the Dental profession generally, in different parts of the country.

“The publication of a periodical journal, and by

“The maintenance of the spirit and provisions of the Dentists’ Act, by such lawful means as may be necessary, &c., &c.”

Extract from the Bye-laws.

A person who is registered in the Dentists’ Register shall be eligible for election as a member of the Association, provided that he be of good character ; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a show-case exposed to public inspection ; or by means of public advertisements or circulars, describing modes of practice, or patented or secret processes ; or by the publication of his scale of professional charges.

Any registered practitioner not disqualified by any Bye-law, who shall be recommended as eligible by any three Members of the Association (the recommendation of one being from personal knowledge), and who has signed the appended form of application for admission and agreement as to terms of Membership, may be elected a Member by the Representative Board or by a committee appointed for that purpose by the Board, or by the Council of a recognised Branch.

The subscription is One guinea per annum, and each member is entitled to a copy of the Journal of the Association monthly, and to attend the Annual Meetings of the Association.

Forms of application for membership may be had of the Hon. Sec., 40, Leicester Square, London, W.C.

BENEVOLENT FUND OF THE BRITISH DENTAL ASSOCIATION.

Chairman—F. CANTON, Esq., (Pres. of the Representative Board.)

Trustees.

SIR EDWIN SAUNDERS, London.	|	RICHARD ROGERS, Esq., Chel-
JAMES PARKINSON, Esq., London.		tenham.

Hon. Treasurer and Vice-Chairman—A. J. WOODHOUSE, Esq.

Committee of Management.

ASHLEY GIBBINGS, Esq., London.	HOWARD MUMMERY, Esq. London.
S. J. HUTCHINSON, Esq. London.	S. LEE RYMER, Esq., Croydon.
GEORGE WM. PARKINSON, Esq., London, (Hon. Sec.)	

BRITISH DENTAL ASSOCIATION, WESTERN BRANCH.

OFFICERS, 1890-91.

President—J. T. BROWNE-MASON, L.D.S., Eng.
President-elect—E. L. DUDLEY, L.D.S., Eng.

Vice-Presidents.

W.A. HUNT, L.R.C.P., M.R.C.S., Eng.	E. APPERLY, L.D.S., Eng.
GEO. C. McADAM, L.D.S., Eng.	F. H. BALKWILL, L.D.S., Eng.
J. T. BROWNE-MASON, L.D.S., Eng.	J. C. OLIVER, L.D.S., Eng.

Hon. Treasurer—J. T. BROWNE-MASON, L.D.S., Eng.

Council.

J. M. ACKLAND, M.R.C.S., L.D.S., Eng.	W. HELYAR, L.D.S.I.
W. F. CORNELIUS, L.D.S., Eng.	A. KENDRICK, L.D.S., Eng.
E. L. DUDLEY, L.D.S., Eng.	T. COOKE PARSON, M.R.C.S., Eng.
H. P. FERNALD, L.D.S.I.	G. B. PEARMAN, L.D.S., Eng.
J. H. GARTRELL.	R. ROGERS, L.D.S.I.
T. TAYLOR GENGE, L.D.S.I.	J. J. H. SAUNDERS, L.D.S.I.
E. GOODMAN.	A. SMITH, L.D.S.I.

W. CALEB WILLIAMS, L.D.S., Eng.

Hon. Sec.—HENRY B. MASON, L.D.S.

A person who is registered in the Dentists' Register shall be eligible for election as a Member of this Branch, provided he be of good character; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a showcase exposed to public inspection; or by means of public advertisements; or circulars describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges.

Any dental practitioner who can subscribe to the conditions laid down in Bye-law 4, who has been recommended as eligible by any three members of this Branch, may be elected a Member by the Council, and shall be admitted a Member of the British Dental Association.

THE MIDLAND BRANCH OF THE BRITISH DENTAL ASSOCIATION.

President—G. BRUNTON, Esq., Leeds.

Vice-President—H. C. QUINBY, L.D.S., Liverpool.

President-elect—ALEX. FOTHERGILL, L.D.S., Darlington.

Treasurer—S. WORMALD, L.D.S., Stockport.

Hon. Sec.—J. RENSCHAW, L.D.S., Rochdale.

Council.

H. CAMPION, M.R.C.S., Manchester.	G. BRUNTON, Leeds.
E. H. WILLIAMS, L.D.S., Manchester.	G. G. CAMPION, L.D.S., Manchester.
W. GLAISBY, L.D.S., York.	J. A. FOTHERGILL, M.R.C.S., L.D.S., Darlington.
T. MURPHY, L.D.S., Bolton.	J. L. PIKE, L.D.S., Sheffield.
M. JOHNSON, L.D.S., Chester.	W. E. HARDING, L.D.S., Shrewsbury.
H. BLANDY, L.D.S., Nottingham.	J. C. STOREY, L.D.S., Hull.

Members of Representative Board, T. E. KING, L.D.S., York. G. G. CAMPION, L.D.S. Manchester.

EXTRACT FROM BYE-LAWS.

Composed of Members of the British Dental Association who reside in the Midland and North-Western Counties of England, and of Associates who can fulfil the conditions laid down in the Bye-laws. The Annual Meeting takes place in May.

2. The Association shall consist of Members and Associates. No one shall be eligible for membership who is not already a member of the British Dental Association. Any registered Practitioner of good character, who does not conduct his practice by means of the exhibition of Dental specimens, appliance or apparatus in an open shop, or in a window, or in a show case exposed to public inspection: or by means of public advertisements or circulars describing modes of practice; or patented or secret processes; or by the publication of his professional charges, may be admitted as an Associate. Associates shall be entitled to all the privileges of the Branch Association, but shall not be entitled to vote or hold office therein.

3. Any member of the British Dental Association may be elected a Member of the Branch by the Council of the Branch, at any of their Ordinary Meetings, on his sending a written application for election to the Secretary of the Branch.

4. Any registered Practitioner who can subscribe to the conditions laid down in Bye-law 2, and who shall be recommended as eligible by any three Members or Associates, may be elected an Associate by the Council, on his forwarding the recommendation and his subscription to the Honorary Secretary of the Branch.

BRITISH DENTAL ASSOCIATION. EASTERN COUNTIES BRANCH.

OFFICERS, 1890-91.

President—AMOS KIRBY, L.D.S., Eng.

President Elect—R. PAYLING.

Hon. Treasurer—H. F. WHITE, L.D.S., Eng.

Council.

J. FENN COLE, L.D.S., Eng.

B. W. HARCOURT.

F. Hall, L.D.S.I.

R. P. LENNOX

H. W. TRACEY, L.D.S., Edin.

G. CUNNINGHAM, M.A., Cantab.
L.D.S., Eng, D.M.D.

ALEX. KIRBY, L.D.S., Eng.

R. PAYLING.

R. W. WHITE, M.R.C.S., L.D.S., Eng.

Hon. Secretary—W. A. RHODES, L.D.S.I.

Districts.

Norfolk, Suffolk, Cambridgeshire, Essex, Lincolnshire, Northamptonshire, Huntingdonshire, Bedfordshire, Hertfordshire, and Bucks.

Bye Law.

Any Registered Dental Practitioner, who shall be recommended as eligible by any three members of the Branch, (one being from personal knowledge,) may be elected a member by the Council. The election to be by ballot: three black balls to exclude.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF LONDON, LEICESTER SQUARE, W.C.

President—MR. LEONARD MATHESON, L.D.S.

Vice-Presidents:

MR. J. F. COLYER, L.R.C.P., M.R.C.S., L.D.S.

MR. F. C. PORTER, L.D.S.

Treasurer—W. C. J. PREEDY, L.D.S.

Secretaries—MR. GEO. HERN, L.D.S., MR. F. A. HARSANT, L.D.S.

Curator and Librarian—MR. E. H. L. BRIAULT, L.D.S.

<i>Second Years' Students.</i>	<i>Councillors.</i>	<i>First Years' Students.</i>
Mr. W. R. BARRETT,		Mr. T. COYSH.
Mr. E. BULL.		Mr. H. GODDARD.
Mr. C. SCHELLING.		Mr. E. J. HALL.
Mr. W. S. HOLFORD.		Mr. J. HUMPHREYS.
Mr. W. MAY.		

The object of the Society is the consideration of matters specially appertaining to Dentistry. The affairs of the Society are managed by a Council consisting of a President, two Vice-Presidents, Treasurer, two Secretaries, Curator, and nine other members. The President is chosen from the past Students who have obtained their degree of L.D.S. ; the Vice-Presidents from past Students with or without qualification.

Any gentleman wishing to become a member, must be proposed and seconded at one meeting, and be balloted for the next ; one black ball in four to exclude. The entrance fee for ordinary members is half-a-crown, and there is an annual subscription of the same amount.

Ordinary meetings are held at 8 p.m. on the second Monday in every month, from October to March inclusive. The annual meeting for the election of officers and other business is held on the third Monday in January in each year.

Every member has the power of introducing one visitor, not being a Student of the Hospital or School, to the meetings, with the consent of the President. Visitors are invited to take part in the discussion of the papers and clinical cases.

There is a Library and a Museum in connection with the Society, both being under the superintendence of the Curator.

The Council offer a prize, value £3 3s., at the end of each year, for the best paper read before the Society during that year.

STUDENT'S SOCIETY OF THE NATIONAL DENTAL HOSPITAL AND COLLEGE.

President—PETER GREETHAM, Esq., L.D.S., Eng.

Vice-Presidents.

P. SYDNEY SPOKES, Esq., M.R.C.S., L.D.S. Edin.

MORGAN HUGHES, Esq., M.R.C.S., L.D.S., Eng.

Council.

Past Students.

R. S. N. FARO, L.D.S., Eng.

WILLIAM RUSHTON, L.D.S., Eng.

A. P. STOCKEN, L.D.S., Edin.

Present Students.

F. E. CUTTS.

HORACE W. JOHNSON.

G. M. KEEVIL.

Hon. Treasurer and Secretary to the Council.—ARNOLD PRAGER.

Hon. Secretary to the Society.—CHARLES L. ALLNUTT.

Hon. Librarian and Curator—

This Society, which was established March 15, 1878, was constituted for the encouragement and diffusion of knowledge in Dental Science, and for the promotion of intercourse among its Members ; and all Students of Dental Science are eligible for Membership. All Candidates for Membership must be approved by the Council before being proposed to the Society for election. The Entrance Fee is 2s. 6d., and the Annual Subscription, 2s. 6d., to be paid in advance. The Ordinary Meetings of the Society are held on the first Friday in each month, from October to June, both inclusive, at 8 p.m. precisely. Each Member may introduce two visitors, not being Students of the Hospital or College, but the same visitors may not be admitted more than three times during one Session.

British Journal of Dental Science.

No. 545. LONDON, OCT. 1, 1890. VOL. XXXIII.

OPENING ADDRESS AT MIDDLESEX HOSPITAL MEDICAL SCHOOL.

By Mr. STORER BENNETT, F.R.C.S., L.D.S., &c.,
Dental Surgeon to Middlesex Hospital.

GENTLEMEN,—My colleagues, the members of the School Committee, have conferred on me the privilege of giving the first lecture on this, the first day of our medical year, and it is only due that I should take this opportunity of thanking them before you all, for the honour and the confidence they must have shown me, and which confidence, believe me, I do esteem most highly.

My first duty—and a pleasant one it is—consists in greeting cordially those old students who are now returning to the field of their former labours, and in offering my congratulations to those who, like Messrs. Carwardine, Jones and Lucas, have so far distinguished themselves and brought honour to their school in the late examinations at the University of London; these gentlemen raise in me a feeling akin to gratitude, which has been defined as “a lively expectation of favours to come.” But of them and all of you I would beg that the examinations be not regarded as the objects of your study, but as so many landmarks on the road of life, which, being passed, act but as registers of the stages you have travelled; but look rather to the knowledge resulting from the study as the gain you would achieve.

If I may be permitted to advise you, who from your previous work may deem advice unasked a needless interference, I would urge two things—the importance of taking notes, and of constant attendance in the *post-mortem* room. The habit of taking notes of interesting clinical cases is in itself an excellent training of the faculty of observation, for in order to describe you must first yourself observe, and you will find these notes, even meagre though they be, will serve in after

time to recall to your memory, many an interesting case that would otherwise have passed into the limbo of the forgotten. You will notice that I lay stress on the value of attending the *post-mortem* room, and for this reason, that you will there see now what in after years you will have but to *infer*, for these examinations in private practice are all but unattainable.

I am sure I need not urge the necessity of constant attendance in the wards ; they are so full of interest, and from the cases you there see, many and various as they are, you will imbibe a knowledge of the course and treatment of disease obtained, you scarce know when or how, that in the years to come will never leave you, and which no books alone can ever yield. Pray do not misunderstand me, I mean no disrespect to books—they are the outcome of careful thought and keenest observation by our ablest teachers, but he who seeks to gain a knowledge of medicine and surgery from them alone, will find too late, how difficult it is to recognize disease from mere description, or to treat successfully a common injury when reading is his chief or only guide.

But of not less value than the teaching of the wards is that derived from the rooms of our general out-patients, and the special departments that are their complement ; to the former come the cases before admission to the wards, and there are seen disease and injury of less serious but more common form, the counterpart of which will occupy no unimportant section of your future private practice.

It is, I fear, too much the habit of many senior students to look down upon the teaching of these rooms, as being good enough for first year's men, but quite beneath their notice, but believe me, it is not the rare and complicated case, needing profoundest knowledge for its diagnosis and highest skill in treatment, that will avail you in the future, if, in the common matters, that pertain to daily practice, you are wanting. Many men can glibly talk on complex operations, who could not make a decent gutta-percha splint nor reduce a dislocated shoulder.

Those of you who still read Milton are familiar with the noble lines :—

“ Not to know at large of things remote
From use, obscure the subtle, but to know
That which before us lies in daily life,

Is the prime wisdom. What is more is fume
 Or emptiness or fond impertinence,
 And renders us in things which most concern
 Unpractised, unprepared, and still to seek."

The habit of gentleness, courtesy and patience to those committed to your care is but their due, and though it often costs a little self-control—for they may be exacting and unreasonable at times—yet remember they are invalids and severe or long-continued suffering would render most of us less amiable than now we seem to be. These habits, carefully practised as students, will become so much your nature that they will never leave you, for they will be engrafted in your very being ; but think not that they, if neglected now, will come in after years—the worry and the drive of private practice leave no time for cultivating what, at first, came almost without effort. I lay some stress on this because there is such a tendency for dressers and house-surgeons—in, shall I say their over zeal, to do the greatest work in shortest time—to be perhaps a little rough, and show a little less of kindness and of sympathy than, I am sure, on calm reflection they would wish.

I would that we could always bear in mind the words in "In Memoriam":—

"For who can always act? but he
 To whom a thousand memories call
 Not being less, but more than all
 The gentleness he seem'd to be.

"And thus he bore without abuse
 The grand old name of gentleman,
 Defamed by every charlatan
 And soil'd with all ignoble use."

And now, gentlemen, turning to you who to-day begin your studies in this hospital, I bid you hearty welcome, and trust that you will strive your very hardest to maintain its best traditions, seeking even to outdo the deeds of those great men who have preceded you. Such men as Sir Charles Bell, and Moore and Murchison, as Sir John Tomes and Campbell De Morgan, who are fitting examples for emulation by us all.

During these next two years the study of anatomy will engross a large share—and it can hardly be *too large* a share—of your attention. Anatomy is the foundation on which he superstructures of medicine and surgery are built ; you

cannot, therefore, know your anatomy too well. If I urged, just now, your senior colleagues to be constant in their attendance in the wards, to you I would say, "Haunt the dissecting room." Professor Anderson, the great conjuror, on being asked what was the best way to become proficient in *legerdemain*, replied, "There are three rules: the first is practice, the second practice, and the third is practice;" and similarly I would say, that to learn anatomy there are three means: the first is dissecting, the second dissecting, and the third is dissecting. By it you become so thoroughly familiar with the position and appearance of the different structures from various aspects, that their subsequent recognition in the examination room or on the operating table becomes a matter of the greatest ease and certainty; and you will be in no doubt, when at the bedside you are called upon to treat disease, as to whether you have to do with this structure or with that, or whether a certain organ should occupy such a position or such another. Dissecting also familiarises you with the use of instruments, training the hand to follow the eye with precision and exactitude.

But do not think that I am urging you to neglect attendance on your lectures. It is the fashion now-a-days to cry down lectures, and to say that students have too many of them and that all the information there imparted may be obtained equally from books. Now I do not believe that this is true, for though no doubt the books *contain* the information, yet a lecturer, who is worthy of the name, is not content with merely stating a certain fact and leaving it, but by emphasis and stress he indicates what he considers most important, the voice here playing such a part as no book can ever rival. And where a point is more than usually obscure the lecturer can, by repetition, and by approaching it, now from one aspect and anon from another, so circumvent it that it cannot fail to yield. Then the preparations that you see at lectures are a great assistance to your understanding and your memory, for what you actually see needs so much less effort to remember than that you only read about.

The late development of photography, used in conjunction with the optical lantern, is of the greatest assistance to a lecturer, as it enables him to show, to every student *at the same moment*, a faithful picture of the subject of which he then is speaking, and it is, of course, far more accurate than any diagram. And when with such a lantern is combined a

projection microscope, the study of histology is simplified enormously. I look forward to the time, when these most useful aids to both lecturer and student, are regarded as a part of the necessary furniture of every lecture theatre.

And though not urging you to approach the subject of your lectures in a spirit of carping criticism, still it is useful practice to check, as far as possible, what you there hear by your own individual experience, and by the evidence of anything you meet with that will bear upon your subject. Such a habit of comparison compels you not only to listen *but to think as well*, a practice that examiners complain most students are unaccustomed to.

If you will but work steadily, and not fitfully, through the the whole course of your studentship, I can promise that the gentlemen to whom I have just alluded, will seem very different to the almost inhuman creatures they are sometimes credited with being.

Do not be deluded, therefore, into putting off until its near approach, the work of an examination ; remember that time wasted can never be recovered.

“ There is a tide in the affairs of men,
Which, taken at the flood, leads on to fortune ;
Omitted, all the voyage of the life
Is bound in shallows and in miseries.
On such a full sea are we now afloat,
And we must take the current while it serves,
Or lose our ventures.”

Make a practice of regular attendance at the meetings of the Students' Medical Society—the oldest one in London—and endeavour to speak there on all available opportunities, remembering that Bacon says, “ Speaking makes a ready man.” And if adverse criticisms are passed on any observations you may make, always weigh them fairly, endeavouring to answer them with argument untinged with anger. For he who keeps his temper keeps his wits. Of Darwin it was written by his friend and admirer, Tyndall, “ Accomplished naturalists have levelled heavy and sustained criticisms against him, not always with a view of fairly weighing his theory, but with the express intention of exposing its weak points only. This does not irritate. He treats every objection with soberness and thoroughness, surrounding each fact with its appropriate detail, placing it on its proper relations and usually giving it a significance which as long as it was kept

isolated, failed to appear. This is done without a trace of ill temper. He moves over the subject with the passionless strength of a glacier ; and the grinding of rocks is not always without a counterpart in the logical pulverisation of the objector."

In the inaugural address delivered by the President of the British Medical Association, at its annual meeting held this year in Birmingham, the question of the most fitting education of an intending medical student was discussed, and the subject has provoked a controversy in the pages of the public press.

Now, while not wishing to deny the undoubted advantages which a thorough training in the languages of ancient Greece and Rome must yield, yet I cannot help but feel, that we have more elegant translations of the best classical compositions, than the average Greek or Latin student of eighteen can aspire to be the author of. The study of our own literature, forcible and suggestive as it is, will yield as potent a grasp of language and refinement of expression, as is likely to result from the study of the writings in the Greek or Latin tongue. The present century has listened to no finer orator than the late John Bright, whose language and mode of thought were so essentially English. And the works of Shakespeare undoubtedly contain as deep an insight into character, and may rank for nobleness of language, with the writings of the finest classic authors of any age whatever.

It is, however, urged that an advantage of a classical training is the mental discipline it involves. Now, to my mind, the study of natural science compels such accuracy of observation, such close and subtle reasoning, combined with clearness of expression, as no amount of classic teaching can compare with. And of all the natural sciences, for such a purpose, chemistry seems pre-eminently the greatest.

Year by year this subject becomes more and more important, and many of the greatest advances in scientific medicine are due directly or indirectly to its revelations. Where but to chemistry are we to look for explanations of the complex phenomena of physiology ? How but by means of chemistry can we hope to raise prescribing above the opprobrium of mere empiricism ? To the revelations of chemistry is due the greatest boon the human race has ever known—the discovery of anæsthetics—for, to the labours of Sir Humphrey Davy

the discovery of the anæsthetic powers of nitrous oxide will be a lasting tribute, as long as pain and suffering have existence in the world.

The rich harvest of discovery in both synthetic and analytic chemistry in commerce, in the production of new substances or the utilisation of waste ones ; the improvement in public health from the rendering harmless, and even useful, the sewage and other refuse of our large towns ; the benefits to agriculture, and indeed to an infinity of purpose, will yield to the earnest student of this science, a return in comparison with which, the pursuit of classic lore can have no place.

The use with accuracy of delicate instruments, and the most scrupulous attention to detail, which chemical experiments involve, are admirable training for the hand and eye, of him who aspires to become a successful surgeon.

But for the profound insight and beautiful experiments of the chemist Pasteur, leading to his germ-theory of disease, we should to-day be ignorant of the true meaning of pyæmia and septicæmia, of anthrax, chicken cholera, and of many other contagious diseases to which man and the lower animals are victims. I trust, therefore, I may be forgiven for entering a plea for the study of chemistry.

In 1836 it was discovered by Cagniard de la Tour, that fermentation was due to a living organism called the yeast-plant, which in a suitable soil, feeds, grows and reproduces itself. Schwann also discovered the yeast plant independently, about the same time, and in the following year, made the important observation, that a decoction of meat, if carefully protected from ordinary atmospheric air, and only supplied with air which had been highly heated, would never putrefy. Putrefaction, he therefore stated, was not caused by the air, but by something which a sufficiently high temperature would destroy.

We have been long aware that some diseases are the result of parasitic growth, and modern investigation is constantly adding to their number, but a quarter of a century ago we were groping in the dark for the origin of many epidemic diseases which are now known to be due to the growth and reproduction of parasites. Such was found to be the nature of a disease, which at that time, threatened to be the ruin of all silk industry, from which the French derive so large an income.

In 1853 the silk culture of France yielded a revenue of

130,000,000f., and the industry was steadily increasing year by year. The weight of the cocoons in 1853 was 26,000,000 kilogrammes; but a terrible calamity now affected this thriving industry, for by 1865 it had fallen to 4,000,000, entailing in one year alone the loss of 100,000,000 francs or £4,000,000 sterling. It was at this time that the great French chemist, Pasteur, was induced to investigate the cause of this terrible national misfortune, though previously he had never even seen a silkworm, and for the purpose he took up his abode in Alais, the chief centre of the silkworm culture, and that most seriously affected by the disease.

He found the silkworms suffering from an affection called *pébrine*, in which its victims are covered by black spots, are stunted and unequal in their growth, their movements being languid, and their appetites characterised by unusual capriciousness, and their death prematurely taking place.

In 1849 vibratory corpuscles had been noticed in the blood of affected silkworms, and they were subsequently discovered in all the tissues of the body, and in the eggs laid by the affected worms. These corpuscles, possessing the power of indefinite reproduction, are really the cause of its mortality, for being introduced into the intestines, they spread thence throughout the entire body, and even filling the silk cavity; so that while the worm goes automatically through the spinning process no silk is produced, since the clear glairy material, from which the silk should be derived, has been replaced by enormous crowds of these corpuscles.

It was to this feature of the disease that Pasteur devoted himself. The history of a silkworm's life is a very varied one. From the egg is developed the worm, which, growing, sheds its skin, and then, climbing the brambles spins among them its cocoon, passing thus into a chrysalis and ultimately a moth; it then lays its eggs, from which the process recommences.

Now Pasteur found, that the vibratory corpuscles might be either incipient in the ovum or germinal in the worm, and in both conditions elude observation. Growing however with the worm and in the aged chrysalis being larger still, they are seen with greatest ease in the body of the moth, if this has been derived from an egg or worm which has been at all affected. This was Pasteur's great discovery of 1865.

Naturalists had previously advised examination of the eggs for the detection of these corpuscles before subjecting them to

incubation ; Pasteur, however, showed that both the eggs and worms might be affected without detection, resulting inevitably in a generation of chrysalises incapable of yielding silk. He therefore started from the moth in his crusade against the disease, and examining them, succeeded without difficulty in determining which moths were healthy and which were affected, and, therefore, which series would yield the healthy eggs and from which a fresh crop of the disease might be predicted to result. But the investigations of this great chemist like those of his great follower, Sir Joseph Lister, were for long derided, and it was not until he had resorted to prediction, his prophecy coming true, that the value of his work was recognised by his fellow-countrymen.

Having shown the disease to be due to a micro-organism, the next step was to trace the manner in which the contagion was spread, and for this purpose Pasteur performed numerous experiments, the history of one of which can hardly fail to be of interest. Having selected a number of silkworms derived from healthy moths, they were subjected to treatment. For this purpose a worm, known to contain the corpuscles, was rubbed up in water, and the mixture smeared on mulberry leaves, with which the healthy worms were fed. In the course of three weeks, all the worms were covered by the characteristic black spots of *pébrine* ; and on the following day were dead. Not one of the worms experimented on escaped, and yet they had received but one infected meal.

In a subsequent experiment healthy and diseased worms were put together, and it was then found that the healthy ones were inoculated by wounds caused by the claws of their infected neighbours ; on their claws being washed the parasites were found in the water.

These experiments were conceived and carried out in the truly scientific spirit which characterises the work of this great man. It is difficult at the present time, when the subject of micro-organisms has been so long before us, to appreciate the difficulties which surrounded any such investigation.

On his discoveries in fermentation he founded his germ theory of disease, which has done so much within the last few years to throw light on the nature of infectious maladies. Starting with the conception that they were spread by means of putrefactive germs either floating in the air, or suspended in water, he proved in many cases—such as anthrax, chicken cholera, &c.—how correct his theory was.

During some investigations it was found that birds were insusceptible of inoculation with anthrax virus, while guinea-pigs died within a few hours of its injection. Knowing the powerfully destructive effect of a few degrees of heat on certain organisms, it occurred to Pasteur to lower artificially the temperature of birds, and injection then proved fatal to them; similarly when the temperature of guinea-pigs was raised, they could be injected with the otherwise deadly virus with impunity.

Once a disease is traced to its true source, we have proceeded a long way on the road that leads to a knowledge of its cure; and the working out of the life history of the *Bacillus anthracis* renders the cure of splenic fever as certain as was the stamping out of *pébrine* after Pasteur's investigations.

A similar result was hoped for from experiments with hydrophobia, but although it seems most probable there is a distinct microbe of this terrible disease, so far it has been impossible to isolate it. At present the cause can only be surmised, though the treatment has been more fortunate. Previous to these discoveries the death rate of those who were bitten on the head or face was as high as 70 per cent., while since the introduction of these inoculations it has been reduced to 2·3 per cent., and these head or face bites have always been regarded as most difficult to deal with.

The latest investigations in bacteriology have led to the isolation and cultivation of a bacillus believed to be the cause of that terrible infectious malady, diphtheria, and the memoirs of MM. Roux and Versin seem to set at rest the vexed question, as to the identity of diphtheria and croup, for by means of the cultures they have made, the two diseases are shown to be distinct.

In the Pasteur Institute, and other laboratories, investigations are being carried on which have already resulted in remarkable discoveries into the nature of tubercle, that dire scourge of the human race and many lower animals; of leprosy, the cause of misery to countless thousands; of anthrax, chicken cholera, and hydrophobia; of distemper, that affliction to which our most valuable young dogs are victims; into the nature and treatment of rouge or red soldier, from which swine are such serious sufferers, and latest of all, into diphtheria.

These are some of the results of Pasteur's investigations

into the nature of fermentation. Enormous strides have also taken place in our knowledge of cerebral localisation, resulting in the most brilliant results in what is known as "brain surgery."

The vast majority of men of science are lovers of the lower animals, and would not needlessly inflict on any one of them the slightest pain, but all these brilliant triumphs of modern investigation would have been impossible had the opponents of experiments on living animals had their way, and we should at the present time be as ignorant of the nature of, and therefore as incapable of rendering assistance to, our fellow-men and their friends and servants, the lower animals, as we were a hundred years ago.

It would be interesting, did time allow, to investigate more closely these experiments and many others of a like nature, but enough has been said if it induces any of you to follow up the study of chemistry, without an accurate knowledge of which these magnificent discoveries would have been impossible.

Those of you who have sufficient time and inclination to visit the Pasteur Institute, will, I am sure, be well repaid by what you see.

In that Institution, every morning at eleven, crowds of patients, who have been bitten by rabid or suspected rapid dogs, or other animals, attend for treatment. This consists in washing the skin with an antiseptic solution, and then injecting, on a dozen to five-and-twenty different days, a solution of the attenuated hydrophobia virus. Those who have been bitten about the head and face have to submit to the more lengthened course of treatment, while the shorter one only is adopted when the bites are on the limbs. In those rooms are excellent opportunities for studying character, for it is seldom that we see in the course of one morning, eighty to a hundred individuals submitting to an operation which is alike in every one of them. Some will bear the injection without the quiver of a muscle, while only the strongest physical restraint can compel others to submit to it.

The laboratories, kennels, and hutches are all deserving of a visit, and are full of interest, the experiments on animals being in every case conducted while they are under the influence of anæsthetics; while the courtesy with which the great Pasteur receives his visitors, is an added charm we are never likely to forget.

In the earlier part of my address, gentlemen, I endeavoured to impress upon you the importance of regular and thorough work, but I do not forget that the healthy mind and healthy body are most likely to be found in company. Do not, therefore, neglect to take a reasonable share of relaxation also, and of all forms of indoor distraction I know of none which so quickly and so effectually affords relief, to a tired and jaded student, as the pursuit of music. It is one to which he can ever turn with pleasure, for solace in his trouble, for relief from his fatigue, and its influence is refining on all who come within its sphere.

We have, connected with this School, a club for most forms of athletic exercises, but there is one which I always feel sorry is so utterly neglected—I mean the art of swimming. It is graceful, invigorating and delightful, but since we are trained for a profession whose aim is to save the lives of our fellow creatures, I should like to see especial attention directed to proficiency in swimming with one's clothes on, and in the necessary practice for saving lives of others who may be drowning. We all know how easy it is to swim in the ordinary manner, and that mere rapidity of getting through the water, or the capacity for swimming a great distance, are but questions of practice and of staying power. I fancy, however, most of us would find that, without especial training, much more was needed to enable us to save a drowning man, than a mere ability to swim. I have pleasure, therefore, in commending this subject to your notice.

In the course of this address I have had occasion to mention the names of several men of whom it may be truly said, "the world would have been losers had they never lived." I would the same may be said of us, and that we may have equal satisfaction when the time arrives.

"To seek the chimney nook of ease,
And there to ruminate in sober thought
On all that we have seen, and heard and wrought."

THE EVOLUTION OF MEDICINE AND SURGERY AS A SCIENCE.

An Introductory Address delivered at St. George's Hospital.

By AUGUSTUS WINTERBOTTOM, F.R.C.S.

Consulting Dental Surgeon to St. George's Hospital.

Mr. Chairman and Gentlemen,—This afternoon it is my privilege to give a hearty welcome to you all, as fellow-students, and to invite your attention to an opening address.

To my colleagues I tender sincere thanks for unvarying courtesy and kindness during years of active association.

To other Hospital friends, absent and present, and to the new friends who join us this session, I wish an earnest God-speed.

I have listened with admiration to many annual addresses delivered in this theatre, and I only accepted the invitation to confront an audience myself, after careful and anxious hesitation.

Without the gift of oratory, so brilliantly displayed here by some of my predecessors, and distrusting my power of competing with others as an essayist, I have decided to risk your criticism in the less ambitious position of a mere historian.

The subject of my historical sketch is the evolution of medicine and surgery as a science up to the founding of our first college, and the evolution of St. George's Hospital as a school: and I selected it in the hope of being able to interest you in what has greatly interested me.

But before beginning this narrative, I will briefly refer to the change and reform which has taken place in connection with our *Alma Mater* during the past year, and there is one reform which must mark an epoch in its history.

This consists in the duplication of the junior staff of physicians and surgeons, and I deal with it first, because a distinct importance gives it, in my opinion, a distinct preference.

It offers what I may term the possibility of an "all round" advantage.

To the students (and I place what is to their benefit in front, because the welfare of the sick is dependent upon the

early training of those who attend them) the advantages are difficult to over-estimate.

They can gain in supervision, in careful direction, in particular, clinical study and instruction, and in opportunity for individual experience and research.

To the residential staff all these advantages should be even more distinctly emphasised and apparent.

To those who seek relief from our Hospital, the benefits are not merely prospective. The weary waiting in the out-patient room will be immediately relieved, and the business-like phrase, "continue as before," after a moment's interview, can be supplemented by some words of explanation and encouragement. The in-patient can feel less nervous about questioning the resident officer because "he is so busy," when the answer to the question may mean something more than a personal relief and represent no small factor in the successful treatment of the disease.

These are mere sketches of the immediate capabilities of this reform, and but feebly comprehend its complete value as a progressive measure.

I now come to our changes. We have lost, but we have also gained.

The resignation, through ill health, of so eminent a colleague as Dr. Gamgee, calls forth something more than a selfish regret; but it introduces the services of Dr. Penrose, to whom, in the name of the staff, I now give greeting.

My appointment, as consulting dental surgeon, brings forward Mr. Henry Albert into the more active position I have vacated, and it is my pleasure to welcome him as a colleague we all greatly respect.

The addition to the staff of dental surgeons, in the reappointment of Mr. Vasey, gives me particular gratification, for he was my first teacher, and the creator of a dental specialism in St. George's Hospital. What he has done for our section of surgery is inadequately conveyed in the reflection that he has personally relieved thousands, and by his excellent teaching given hundreds of students the opportunity of proving worthy of their master. To find my name coupled with that of so valued a friend and so eminent an authority, is an honour I cannot over-estimate.

In considering the evolution of medicine from complete obscurity, I propose to pass over its possible emergence from the lowest depths of magic and mystery during the time of

the Egyptians and early Hindoos, and take, for my starting-point, a period that has some written history, of however doubtful a contemporary value.

Æsculapius was acknowledged by Homer to have been an excellent physician of human origin, so we can only regret his latter reappearance, clothed in the garb of a Grecian god, as that of a colleague who had fallen from good estate.

According to some commentators, his medical and surgical knowledge far exceeded anything that has been attained in modern times, but Plato (born B.C. 428), Plutarch and Pindar (born B.C. 522), agree that the practice of his sciences was by "songs, drinks, external medicines, and incisions."

We have no record of the composition of these "drinks" and "external medicines," so his credit as introducing some form of "prescribing" represents the only value to us of his connection with any evolution of medical science.

With his degradation to godhood, any further association of this "father of medicine" with the development of his art would be unreasonable, were it not that we find history refers to the exercise of his earthly profession being continued by his two sons, Machaon and Podalirius. These descendants of a doubtful ancestry were surgeons by appointment to the Greek Army during the siege of Troy, and, according to undisputed authority, were brave and attentive to their patients.

It is noteworthy that with these reputed sons of Æsculapius we come upon the first movement towards separating the special practice of medicine from that of surgery. Machaon was, we are told, distinctly a surgeon; but Podalirius had received from his father "the gift of recognising what was not visible to the eye and tending what could not be healed."*

As the figures of these two ancient practitioners form the supporters of the Arms of our Royal College of Surgeons, their later history may be worth a few moments' consideration.

Machaon, according to Homer, was wounded in early life, though he recovered under a *regime* of Pramnian wine with cheese and onions, prescribed for him by the sage Nestor. Eventually he met with a tragic death, but not until he had begotten six sons, who all adopted the profession of their father.

The several accounts of Podalirius differ, so I feel justified

* From *Ethiopis* of Archaius, quoted by Welcher and Hæser.

in selecting the most romantic as the most appropriate to my present subject, because it introduces the first record of an operation, which has since been so terribly abused.

Returning from Troy the misfortune of shipwreck left him a wanderer on the peninsula of Caria, where he was kindly welcomed by king Damoetas.

At this time the Court was in despair, for the young princess had fallen from the roof of a house, and was bewailed as one about to die. But Podalirius effected a cure by *bleeding her in both arms*. Here we have the first historical account of the performance of localised blood-letting as distinct from general incisions.

I pause after referring to the earliest record of "prescribing, of a distinction between medicine and surgery, and of localised blood-letting, to speculate upon the possibility of the earliest record of a fee.

Podalirius became betrothed to his patient, and received her hand in marriage, presumable as a suitable reward for his professional services.

Thus far the written history of medicine, although mingled with mystery, appears to have been unaffected by the influence of trickery. But unworthy successors of Æsculapius and his sons appeared in the sect of Asclepiads, who claimed to have inherited the skill of the "God of healing."*

Forming themselves into a priesthood, they associated the practice of medicine with that of priestcraft.

They declared all professional knowledge to be sacred, and only to be passed on from father to son under an oath, which the latter was obliged to take before being put in possession of the medical secrets.†

These charlatans attached themselves to the temples of Æsculapius (usually erected in the healthiest places), and to which the sick were carried. Here the patients were supposed to have the cure for any particular ailment revealed to them in a dream, which was only capable of interpretation by the priests, and before leaving made an offering to the "God," and had the nature of their cases and cures inscribed upon votive tablets, with which they decorated the walls and columns of the temples.

Under these restrictions the practice of medicine was imprisoned for centuries, and any possible early development of its science remained buried as a profound secret.

* Æsculapius.

† See Galen, Anat. ii. p. 128.

The value to medicine of the physiological doctrines of Pythagoras (born B.C. 540), Anaxagoras (born B.C. 500), and Democritus (born B.C. 460), who was the author of the atomic theory, is a very doubtful quantity, but perhaps their greatest collective service consisted in an accentuation of the spirit of rivalry which eventually broke up the reign of the Asclepiads.

With the revolt of Crotona the teachings from the temple practically ceased. The study of medicine was open to all comers, and by the public instructions of Metrodorus (B.C. 440?) the public practice of medicine was initiated.

Any useful knowledge hitherto preserved as a secret was now offered to the world, and professors of medicine, known as *Periodontæ*, were found migrating from town to town in search of pupils and patients.

About this period the real author of the medical art, and of the character of the physician as we now understand it, appeared in Hippocrates (born B.C. 460), and, historically the seventeenth or nineteenth in direct descent from Æsculapius.

From his own writings we can gather the first distinct system of medicine, which, however faulty, represents the root of a fruitful tree.

The mainspring of his doctrine was *the intense value of the closest observation*, but this grand step forward was almost paralysed by his famous theory,† that *the body contained four humours—blood phlegm, yellow bile and black bile*. A right proportion and mixture of these was declared to constitute health, and *the value of observation was to be subservient to the recognition of this as an axiom*.

A doctrine of secondary but considerable importance was *the healing power of nature*, which was to be assisted, but never hindered, so that the sick man might conquer disease, *by the aid of his physician*.

I may here mention that it is somewhat difficult to reconcile such moderation with the maxim usually attributed to Hippocrates that *what could not be cured by medicine could be cured with the knife, and what could not be cured by the knife could be cured by fire*.

The crisis or "periods of expulsion of the humours" through one of the natural channels of the body were always

* *Historia Medicinæ a rerum initio, ad annum urbis Romæ to 35* (Schulzius.)

† Known as the "humoral theory."

anxiously looked for, and he declared it to be most important to foretell them with precision.

To establish a correct prognosis, based upon the result observed in previous cases, was to be the aim of every physician, hence the importance of recording all the details of clinical experience, and the introduction of what we now term case-taking.* Diagnosis was in its extreme infancy, as without the knowledge of anatomy there could be no scientific nomenclature of disease.

With regard to treatment, diet was his first active principle ; then came the exhibition of one or more of the known drugs,† but only at such times as experience warranted their tending to the greatest relief of the patient.

The value of the pulse, as an indicator of health or disease, was presumably unknown to this teacher, as it is never referred to in any of those works which can reasonably be attributed to him.

After the death of Hippocrates, the researches of his pupil, Aristotle, in comparative anatomy and physiology, greatly assisted the progress of medicine, and his teachings bore good fruit, which remained sound for centuries after his death.

Although Aristotle is guaranteed by several contemporaries as the friend of Plato, the friend of Socrates, but above all the friend of truth, time will only allow me to briefly mention two of the more important discoveries, *i.e.* truths, with which he is credited. The assigning the origin of the blood-vessels to the heart, though he failed to distinguish between arteries and veins, is the first, and the recognition of a contractile property in muscular tissue is the second. Antivivisectionists must regret that this particular advance in physiological research, was the result of his opening the living chameleon and observing the actions of its intercostals muscles.

The conquests of Alexander, led to the formation of more than one learned centre, in which medicine had its share with other sciences, and of these Pergamus was the first to become famous as a medical school.

But notwithstanding this great opportunity for the further development of our art, medicine and philosophy, under the dogmatists of Cos, and later on under the empirics of Cnidos, were almost as disastrously combined, as were priest-craft and

* It has been said that the inscriptions on the votive tablets in the temples, first suggested to Hippocrates the value of clinical records.

† There were about 260 known drugs at that time.

medicine in the days of the Asclepiads before Hippocrates. And this deadlock continued for centuries.

I should here explain that the empirics were a sect brought into existence by the decaying condition of the dogmatic school about B.C. 280.

"Experience" was the key-note sounded by its earliest founders, and no one was justified in pretending to any real knowledge in disease, without having frequently observed similar cases under like circumstances.

"Theorem" was the term by which the remembrance of such cases was designated and the physician with the greatest number of "theorems" took the highest rank.

Later on some of the originators of this sect indicated a third method of arriving at a knowledge of curative means, and this, which consisted in a comparison being drawn between existing cases and similar ones, was known as "analogism."

Although it is evident that the foundation-stones of this school were quarried from the whole fabric erected by Hippocrates, Serapion of Alexandria, one of the reputed founders, wrote in no measured terms against the Hippocratic teachings, and busied himself almost exclusively with researches on drugs.

Celius Aurelianus in quoting his book "Ad Sectas" censures him for the acrid remedies he prescribed in angina, and for his neglect of dietetics; and Dunglison, in referring to the superstitious remedies employed at that period, states that besides using castor for epilepsy, Serapion recommended the brains of the camel, the heart of a hare, the blood of the turtle, the rennet of the sea-calf and the excrement of the crocodile.

Up to the founding of the Alexandrian school by the first Ptolemy* about B.C. 300, the dogmatics and empirics freely discussed the philosophical aspects of disease, but without any apparent interest in its structural relations. The existing laws disallowed any interference with the dead, and no one was permitted to die within the temples, lest the curiosity of the priests should tempt them into disobedience.

The early Alexandrians were subject to no such restrictions and, stimulated by the discoveries of Aristotle in natural history and comparative anatomy, undertook for the first time, to describe the human frame from actual dissections.†

* Ptolemy Soter. † See Med. Prof. of Ancient Times, by J. Watson.

In this school Herophilus taught anatomy and dissected bodies of malefactors and, according to some historians, even opened those of living criminals. Together with Erasistratus his rival, who first distinguished between sensory and motor nerves, he made clear most parts of the human body, and to him belonged the credit of following the nerves to their origin in the spinal cord and brain. He also traced the arachnoid into the ventricles, which he imagined were the seats of the soul, and followed the tortuous sinuses of the dura mater into that meeting point, which to the present day is known as the "Torcular Herophili." His erroneous association of the arterial system with that of the bronchial is a pleasing reflection, as it discredits the probability of his having ever vivisected human beings.

Later on the public discussions, of medicine and physiology, led to controversy and speculation taking the place of continued scientific research, until a rivalry, similar to that existing between the dogmatists of Cos and the empirics of Cnidos, arose between the younger school of Alexandria and its elder brother Pergamus. Meryon states that the second Ptolemy* interdicted the export of papyrus, because he was jealous lest the library of Pergamus should excel that of Alexandria; a prohibition which stimulated the king of Pergamus† to the discovery of parchment, and to the enrichment of his kingdom by its commerce. "Thus," says Watson, "two of our own words, paper, from papyrus, and parchment, from Pergamus, stand as monuments of the rivalry in collecting books which once existed between Eumenes of Pergamus and Ptolemy of Egypt.‡

At the time Galen began to devote himself to medicine, A.D. 155, the dogmatists and empirics continued even more occupied in philosophical antagonism than in any scientific advancement, and an important third party, known as the methodists, was disputing their field of battle. In addition to these, three minor sects, of recent date, were enlisting recruits under the names of eclectics, pneumatics, and episynthetics.

Galen declined to attach himself exclusively to any of these schools of philosophical medicine, and even assumed an attitude which might have disconnected medicine and philosophy

* Ptolemy Euergetes.

† Cumenes.

‡ Watson's Med. Prof. of Ancient Times.

had it not embraced such tenets of the existing schools, as he believed to represent the simple truth. As with his death all the old sects disappeared, it is reasonable to conclude that they became merged in his followers.

So great was the genius of this master, that by a system of investigation, the reverse of what we should now consider correct, he almost invariably succeeded in attaining the object he had in view.

His services, though hampered by a philosophical vein, always evident (notably his theory of "temperaments"), were of immense value to the progress of medicine, but his advancement of the knowledge of anatomy and physiology was the least encumbered with speculation, and the most valuable work of his whole life.

Our interest in this stage of evolutionary medicine is accentuated by the reflection that he never refers to having had any personal experience in human dissection, though he frequently recommends that of apes, bears, goats, and other animals. As evidence of his valuable researches being conducted without the advantages open to Herophilus and others, he mentions, in one of his numerous works,* as something extraordinary, that those physicians who attended the emperor Marcus Aurelius in his war against the Germans, had the opportunity of dissecting the bodies of the barbarians.

The spread of Christianity seems to have resulted in the complete disconnection of philosophy and medicine, followed by an intimate association of the new theosophy with most of the medical schools.

During the first century A.D., the doctrine that only the Apostles were capable of healing disease, by a recognised form of "laying on" of hands and "inunction with holy oils," was very popular. Later on it was supplemented by a belief in the disciples of Christ having transmitted this power to the elders of Christian communities.

With the influence of these tenets, medical literature, as an aid to medical science, stood still, except in the Alexandrian school, and even there its effects appear to have been severely felt, as all the efforts of the immediate successors of Galen, in the third and fourth centuries, were barren.

Indeed among the physicians, referred to as famous, were

* De compositione medicamentorum secundum genera iii.,
2 vol., xiii., p. 604.

Marcellus, who produced forty-two valueless books on medicine in hexameter verse, and Sextus Placidus Papiensis, who treated quartan ague by the local application of the heart of a hare, and recommended a boiled new-born puppy to be eaten as an everlasting prophylactic against colic.

Elsewhere the mass of publications connected with medicine represented the effusions of certain monks, and contained ridiculous suggestions for a line of treatment to be chiefly assisted by the employment of particular charms,—I wish it to be distinctly understood that my position in referring to these earlier associations of Christianity with the evolution of medicine, is that of a plain historian. No one can regret more than I do that the opportunities offered by the introduction of so glorious a creed should have been first neglected and then dishonoured.

It was not until the fourth century A.D. that out of the shadow of the once brilliant Alexandrian school a distinct illumination arose in the labours of Oribasius, A.D. 326-403. At the request of the reigning Emperor, Julian the Apostate, he made extracts from all the literature left by the ancients, and, after methodical arrangement, divided them into seventy new books, of which we still possess seventeen; but before undertaking this work, he had cut himself adrift from the influence of the monks, by reverting to paganism.

Between the period of his literary efforts and those of Cælius of Armida, there is not one name which is worthy of mention, nor any advancement of a single branch of medical science, with which we can claim acquaintance.

The exact date of Cælius is unknown, but it is most probable that he began his writings about the middle of the sixth century. He was the author of sixteen books of medicine, none of which were remarkable for original matter, but as representing a judicious compilation from the writings of many authors, whose works have been lost, they must be accepted as valuable remains of the historical development of medical science.

He was succeeded by Tralles, 500 A.D., who almost trod upon the heels of Paulus Aegineta, a surgeon and obstetrician worthy of a long remembrance. His great work on surgery was translated into Arabic and laid the foundation-stone of a more perfect architecture erected by Abulcasis, which became one of the chief monuments from which Europe derived its improvements in the "Middle Ages." With the

death of this great teacher, the *requiem* of the earliest school of medicine was sounded, for after his disease no works of any merit were written in the Grecian language.

The rust which accumulated upon this stage of medical science, during the greater part of two centuries, was vigorously attacked by the Islamite rulers in Spain, where special encouragement was given to medicine and general culture. But a fair share of credit is due to the Jews who had already initiated medical schools, which became fully established under Mahomedan government.

This period, known as that of Arabian medicine, extends from the eighth to the twelfth century, and introduces, categorically, the important names of Rhases, who was the first to describe smallpox ; of Mesna, the younger, of Damascus, the accepted author of *De Simplicibus*, which for centuries was the standard work on *Materia Medica* ; of Abulcasis of Cordova, the great encyclopædist, whose work was translated into Latin, and of long repute as the chief authority on surgery in Europe ; of Avicenna, the author of another famous encyclopædia, founded upon the works of Aristotle, Galen, and the later Greek physicians ; and of Averrhoes.

With the death of this celebrity the evidence of any further Saracenic teaching ceases. Though its period of existence was short it was productive of good service to medicine. It introduced many new and useful drugs, notably rhubarb, cinnamon, senna, and camphor, and made known what may be termed the elements of pharmaceutical chemistry, by the discovery of distillation and the means of obtaining various metallic oxides and salts. It also deserves, according to Dunglison, the credit of witnessing the first establishment of public hospitals and pharmacies, which were erected, by the caliphs, in the ancient city of Bagdad.

It is unfortunate that the influence of the Mahomedan laws was disastrous to the possible advancement of surgical science. They absolutely prohibited human dissection, and made the acquirement of any real knowledge of the surgical diseases of women impossible. Anatomy could not be studied from the writings of the ancients, which accounts for original investigation remaining where the Greek teachers left it.

We must now travel into Italy to find the one remaining home of medicine, here represented by the celebrated school of Salerno. This was, later on, eclipsed by the establishment of others at Bologna, where Mondini publicly dissected two

human bodies in A.D. 1315, and was followed by a rapid growth of medical schools in many of the large European towns, notably Vienna, Paris, Padua, Venice, and Florence.

The next century gave birth to Thomas Linacre, who after visiting many of these schools received the appointment of physician to Henry VIII., and devoted the fortune he acquired in this position, to the foundation of a chair of Hippocratic and Galenic medicine at Oxford and Cambridge.

For this service alone his memory is deserving of lasting honour, but it is associated with many other good works, and with one of the utmost importance to the scientific development of the profession his life ennobled.

Linacre was mainly instrumental in transferring the right of the bishops to license medical practitioners in London, to England's first College of Medicine, and this was the Royal College of Physicians of London, established by him A.D. 1520.

At this stage, I conclude my sketch of the early evolution of medicine and surgery, as a science.

We have found its progress developed, or retarded, according to its subjection to influences favourable or unfavourable and among these last we especially notice a too intimate association with any varying forms of religion, philosophical doctrines, and popular discussions. The disposition towards onward movement is always evident with the appearance of any distinct school of teaching, but its real step forward is only capable of leaving a clear footprint behind, when it is unhampered by restrictions too meddlesome and speculations too fanciful.

This criticism applies equally to the value of "schools," in the sense of "seats of learning," and includes those latest developments which have been evolved from our larger European hospitals. Among these, there is one in which we all have, at least, a personal interest, and that is the school we call "St. George's."

Its evolution is sufficiently associated with that of its parent hospital to justify my history in dating back to those days when the fence of Lanesborough House enclosed the stage I now occupy, and the idea of establishing an hospital called St. George's, here, or anywhere else, had, so far as my researches serve me, never been entertained.

Lanesborough House was then the seat of that eccentric nobleman who regarded dancing as the panacea for most dis-

oases, and strongly recommended the exercise to Queen Caroline, as a certain cure for gout. These were those "good old days," so often referred to by the earlier writers of this century, in which the Westminster Infirmary,* represented the only home of charitable relief, for the poor in the West-end of London.

The growing demands upon the limited resources of this, the first hospital dependant upon voluntary contributions, were complicated with a structural decay which earnestly appealed for fresh masonry. Out of the answer to this cry for help, we trace the birth and growth of St. George's Hospital.

The managers of the Westminster Infirmary had the option of selecting between a site in Castle Lane, Pimlico, and Lanesborough House, and a meeting was convened to consider this choice. After stormy discussions, the final decision was referred to a general board of subscribers, who accepted the opportunities suggested by the bargain in Castle Lane. Upon this settlement of the question, many of the original subscribers, backed up by the entire staff of physicians, who were in favour of Lanesborough House, determined to there establish an independant institution, whose term of existence, like that of the Westminster Infirmary, would have to be controlled by the amount obtained from voluntary contributions. This decision was arrived at in the middle of October, 1733, and active measures towards organising the scheme were at once undertaken.

Within three months a staff of honorary physicians and surgeons was elected, a long list of patrons, headed by Royalty, was secured, the necessary alterations of the building were completed, and an equipment sufficient for the reception of thirty in-patients was established.

This is the story of our Hospital being evolved from Lanesborough House. On the 1st of January, 1734, she opened her doors, and labelled herself "St. George's Hospital, for the sick and lame, supported by the voluntary Subscriptions and Benefactions of the nobility, gentry, and others."†

This early appeal was answered more quickly than many of those which have been since issued, even within my own recollection, and under greater stress of circumstances, as before a year had elapsed the accommodating power of the institution was exactly doubled.

* Instituted in 1719.

† This is the exact wording of an inscriptive tablet which was placed upon the centre pediment.

The next stage of development, was a most important one, for it included the purchase of the lease of Lanesborough House* for the modest sum of £500, also the possession of two acres of adjoining land, from Robert, Lord Grosvenor,† and the extension of the existing building, up to a capability of receiving two hundred in-patients. I can find no record of any further development until long after John Howard, the philanthropist, in his observations of the hospitals of England, summed up the sanitary arrangements of St. George's in words few but trenchant, for this is what he said : "I found offensive wards, old beds, sanded floors, and dirty walls." I wonder what he would report if he could revisit us to-day.

In 1825, the growing desire to demolish the existing building and to exert a fresh one, took the active form of initiating a rebuilding fund, and obtaining tenders from various contractors. But four years had to pass before a sufficient amount was collected to justify the erection of the new wings which were soon to be joined to a new body.

In 1834, exactly one hundred years after the birth of St. George's the first, with its thirty beds, congratulations are invited upon the birth of St. George's the second with its three hundred and sixty beds, and its Act of Incorporation, which confirmed all its existing rights and empowered the trustees to hold property to the amount of £20,000 per annum.

We now reach a stage when St. George's takes its rank among the great metropolitan hospitals, with its laws permitting the visiting physicians and surgeons to have a limited number of pupils who might attend their visits to the wards, receive clinical instruction and assist in dressing patients. And so far the primary object of such an institution, which is the relief of the sick, was successfully attained. But as Dr. Page tells us, it fails to fulfil its due measure of usefulness, until it contributes to the education of medical practitioners and to the advancement of medicine and surgery.§

John Hunter was presumably of this opinion in 1783, when he made the proposal for the erection of a school on the footing of Guy's and that each surgeon should deliver six lectures,

* From the Dean and Chapter of Westminster.

† At a peppercorn rent.

§ Account of St. George's Hospital and School, by Dr. Page, p. 10.

though he was still giving his complete series of lectures in Windmill Street, which the pupils of St. George's Hospital were allowed to attend gratuitously. Unfortunately nearly half a century passed before his suggestion was practically utilised in the autumn of 1831, when the first course of lectures on medicine, surgery, *Materia Medica* and midwifery was commenced in the theatre attached to the new Hospital, then in process of erection. Anatomy was still taught, and dissections carried on at Windmill Street, and in a theatre at Mr. Lane's house, adjoining St. George's, in Grosvenor Place, while chemistry classes were held at the Royal Institution, in Albemarle Street.

Great as were the additional advantages thus opened out to the pupils of the hospital, the inconvenience of having the several centres of instruction so widely separated, was not long in making itself felt, and resulted in an anatomical theatre-museum, and lecture rooms, being erected at Kinerton Street, about a fourth of a mile distant from St. George's. This was in 1849, and shortly before the Governors had decided to grant the sum of £200 "for providing instruction in anatomy and chemistry, and for rent, taxes, and repairs of the school premises," a grant which was annually renewed until those particular premises were abandoned. Some of the Governors also established prizes for competition among the students, the first being a clinical one, founded by Sir Benjamin Brodie, who generously advanced the whole of the capital for the formation in Kinerton Street of this, the first compact school of St. George's Hospital.

Its management was entrusted to a committee composed of the entire medical and surgical staff, which was to be under the control of a council composed of twelve members of the Medical School Committee and twelve other governors appointed annually by the Weekly Board.

It was towards the close of this evolutionary period of our school, in 1866, when Dr. Page publicly claimed that it might "fairly challenge comparison, in almost every respect, with those of the older and more richly endowed hospitals of the metropolis."

What shall we say about our present school, opened two years later, and now so greatly developed and improved? We leave this theatre to find, in every passage and corridor, a short path to the grandest opportunities for learning, and to the encouragement of the student in the grandest of

careers. Witness our museum, dissecting and post-mortem rooms, library, lecture theatres, and various laboratories, now almost within touch of each other, and last, though perhaps not least, our students' club. We then turn to the annual report of the Hospital, and notice the important staff of teachers in every branch of medical and surgical science—teachers who have shown themselves devoted to the welfare and interest of their pupils. Mark too the long list of prizes and scholarships offered, some of them almost sufficient in value to represent a free education.

A moment's pause enables us to contrast these advantages with those I have referred to as open to the students of 1831, scarcely sixty years ago.

The thrill of pride which quickens every pulse may be forgiven, for we are all students, and all these benefits are ours. The wave of gratitude which follows, swells with desire to break into a foam of thanks over that rock of glorious tradition upon which is engraved the names of so many benefactors to our school.

I cannot give you the whole of this long and noble list, but surmounted by the date of 1868, which witnessed the opening of our new School, I see four names so deeply graven that I cannot refrain from reading them off. They are those of the deans who have so wisely guided our ship into waters with soundings deep enough to justify a safe onward voyage.

Andrew Barclay is the first of these names, Timothy Holmes is the second, William Wadham is the third, and Thomas Whipham is the fourth.

I dare no more than venture to tell you, that no annual address, delivered in this or any other theatre, has closed with mention of names more worthy of our profound respect and affectionate memory.

RUBBER.

By PROF. C. L. GODDARD, A.M., D.D.S. San Francisco, Cal.

I HAVE found considerable difficulty heretofore in teaching to students the difference between caoutchouc or virgin rubber and the two forms of vulcanite rubber.

Many in their answers to quizzes confound the qualities of

virginia rubber and soft vulcanized rubber. While many suppose that the only difference between hard and soft rubber, is that the one is vulcanized and the other not. Some suppose that the word vulcanize means to harden rubber, but I want to emphasize the statement that that is not its meaning.

Pure caoutchouc lacks many qualities that are desirable, for instance, it lacks durability and loses its elasticity. The discovery was made by Chas. Goodyear in 1843. That if sulphur was added to caoutchouc, and the mixture subjected to heat for a certain length of time, the result was a great improvement in the desirable qualities. The product was called *vulcanized rubber*, and the process vulcanization. It was further discovered either by Nelson Goodyear or by Austin G. Day, that by increasing the quantity of sulphur, and raising the temperature of vulcanization quite a new and different product was obtained and to it was given the name of hard *rubber* or *vulcanite*.

For various reasons I have compiled a table, showing in comparison the qualities of the three forms of rubber on which I have spoken. By *caoutchouc* I mean simply the hardened juices of the rubber tree. By *soft vulcanized* rubber I mean a mixture of 100 part of caoutchouc and 25 parts or less of sulphur, vulcanized at a temperature below 300° F. A familiar example of this is rubber-dam, rubber bands, rubber shoes rubber balls, etc. In the manufacture of various articles the proportion of sulphur, and the temperature, and time of vulcanizing are varied somewhat, and in some instances other materials are added to color or to adulterate the rubber, thus producing various grades. The amount of sulphur that I have mentioned, 25 parts, and the temperature between 250° and 300° F. will be a good average.

By *vulcanite* or *hard rubber* I mean a mixture of 100 parts of caoutchouc with 50 parts of sulphur, vulcanized about 300° F. or 320° F. Examples of vulcanite are artificial dentures, hard rubber combs, pen holders, pencil cases, etc. That the hardness of vulcanite depends principally on the quantity of sulphur mixed with it is proved by vulcanizing a piece of our plate rubber in contact with something that has greater attraction for sulphur. For instance, if a piece be vulcanized in contact with silver some of the sulphur will unite with the silver and the rubber in contact with it will remain soft, owing to the loss of sulphur. Both *soft vulcanized* rubber and *vulcanite* are coloured by

adding various pigments, formulas for which will be given to you later. The colouring matter has, however, no effect in the vulcanizing process, but only adulterates and weakens the product. The comparative qualities are best shown as follows.

Caoutchouc	soft vulcanite rubber	and valcanite.
Pure.	C, 100 + S, 25 or less.	C, 100 + S, 50.
1. Pliable.	Pliable.	Hard.
2. Loses elasticity.	Retains elasticity.	Elastic.
3. Softened by heat.	Unalterable by heat.	Softened by heat.
4. Rigid in cold.	Not affected by cold.	Not affected by cold.
5. Soluble.	Insoluble.	Insoluble.
6. Perishable.	Durable.	Durable.
7. Adhesive.	Inadhesive.	Inadhesive.
8. Unpleasant odour.	Less odour.	Odourless.
9. Non-conductor.	Non-conductor.	Non-conductor.
10. Permeable.	Impermeable.	Impermeable.
11. Not polishable.	Not polishable.	Polishable.

You will see that there are few qualities in which they exactly agree, several which they possess in different degree, and some in which they are very much unlike. Let us look at some of these qualities more in detail.

1. The first two are pliable, that is, in sheets they can be bent readily or applied to any irregular surface. They are soft while vulcanite is hard like ivory. A hard product can be produced from the mixture for soft rubber by adding magnesia, lime or some similar substance. This was the first hard rubber, but was distinctly an inflexible substance.

2, 3 and 4. Caoutchouc, though it is highly elastic, loses its elasticity by being stretched and retained in its new position a few hours or days, or by being subjected to cold, when it becomes hard and inflexible. The elasticity in either case can be restored by a slight degree of heat. Soft vulcanized rubber on the contrary retains its elasticity in all temperatures that do not actually destroy its substance. This is one of the qualities that render it very valuable and useful.

Vulcanite possesses an elasticity like ivory, that is, a vulcanite ball will rebound like an ivory ball. A thin piece bent returns to its former shape more readily than ivory. It is more elastic than ivory, more like steel, though not of course possessing the strength of steel.

The word "elasticity" possesses two meanings. For instance, if we stretch a thin piece of soft vulcanized rubber as much as possible, without breaking, it will return to place.

It is unfortunate that we have not in English two words to express the two ideas.

On the other hand the term "elastic" expresses that quality of both soft and hard rubber by which either if compressed, returns to its former shape. Thus, while we say that both soft vulcanized rubber and vulcanite are elastic, we refer to a different, though in some respects similar property in each.

5. Caoutchouc is soluble in ether, chloroform, sulphide of carbon, naphtha, benzol, oil of turpentine, oil of lavender, oil of caoutchouc, linseed oil, ammonia, and in hot sulphuric or nitric acid. Both forms of vulcanized rubber are practically insoluble. Before vulcanization they can be dissolved but not after. This fact enables us to mix various ingredients with them before vulcanization.

6. Caoutchouc is perishable in the fact that it soon loses its elasticity slight changes in temperature towards either extreme rendering it useless. Many fortunes were lost in attempting to make marketable shoes and clothing of it before the process of vulcanization was discovered.

Soft vulcanized rubber is durable compared with caoutchouc. Though you all know that sooner or later it loses its properties and is easily torn or ruptured, although it will stand the heat even of boiling water for some time. It is spoiled by remaining a long time in a much lower temperature. Soft rubber is sometimes used in the mouth either for artificial vena or to make a soft and pliable edge to a plate. In either of these purposes, however, is it very durable? The heat and moisture of the mouth decompose it. The lack of durability of the soft edge of a vulcanite plate may be accounted for by the fact that both kinds are vulcanized alike, while each kind of rubber should be vulcanized at a different temperature and for a different length of time. The best results for soft rubber cannot be obtained when it is vulcanized at the same temperature as hard rubber. Vulcanite on the other hand is as indestructible as ivory.

7. Caoutchouc is adhesive, that is, it will adhere to other substances, but is especially cohesive, that is, pieces of it will stick together so that they cannot be separated at the point of union any more readily than the pieces can be torn at other parts. Coats, cloaks, and shoes made of it stick together and were thus spoiled. Both the other forms are non-adhesive and cannot be made to stick together except by

means of cement of some kind. They are cohesive only before vulcanization.

8. All kinds of rubber are non-conductors of heat and electricity, but frictional electricity can be produced or developed by them.

9. Neither caoutchouc nor soft vulcanized rubber can be polished. The latter can be vulcanized with a glossy surface, but no alteration can be made after vulcanization except by cutting. The cut surface if rough cannot be smoothed, and any attempt to sand-paper or polish only makes it rougher. Vulcanite on the other hand, can be sawed, filed, sand-papered and polished. It can also be vulcanized with a glossy surface in a smooth metallic mould. The fact that it can be cut, smoothed, polished, etc. is of the greatest importance in its use for artificial dentures.

Soft vulcanized rubber is sometimes used for the edges of plates. But the fact that any change in form must be made by a single cut of the knife or shears and that this cut edge cannot be rounded, smoothed and polished greatly restricts its use.

METAL DIES.


By Dr. D. GENESE, Baltimore, Md.

OF all metal for dies used in swaging dental plates, I have found none so reliable as zinc, tin and lead ; but these metals want careful handling to obtain the best results.

Zinc requiring a high temperature for fusing, has been found fault with and many attempts made to supersede it. After 26 years I fail to find its superior for the male die, and in cases with no undercuts for the female also. This metal can be poured as easily as tin by the following process.

Always use a large ladle, and plenty of metal, heating up with a brisk fire or good gas furnace. Should the zinc be lumpy or old and covered with oxide make it a dull red heat before removing from the fire ; remove the ladle from the fire to the open air away from any building ; have ready $\frac{1}{2}$ an ounce of hydrochloric acid, and pour it gradually into the hot zinc (taking care to get to windward of the fumes) ; have an iron rod to stir the mass, and it will soon be found that the oxide will rise, and a clean liquid metal remain at the bottom,

keeping bright and flowing for a long time, sufficiently so to return to the workshop and pour without dross or bubbles, and with a smooth, clean surface so dense that hammering gold on to it will not bruise.

Casting sand should be moistened with water in which a little sugar is dissolved ; it binds better and takes a clean impression. The closer the sand is pressed the better will be the impression, but it must be left longer to dry, not in an oven, but on a high shelf in warm air. To prevent air becoming pressed in the bottom, groove the back of the mould thus  and the cast will come out perfect, besides the groove of metal acts as a guide in placing the dies together.

A counter die should be used first of lead, but before using it should be wetted with water and glycerine 5 to 1, this prevents lead sticking to the plate. Annealing should always be done before each time of putting the plate between the dies, and all metal plates should be worked bright and never heated without first steeping in the proper acid to remove any particle of inferior metal. A zinc counter die can be made by simply putting French chalk over the die proper.

Tin counter dies give a sharp plate, but is apt to scale and get into the zinc spoiling its hardness, lead will also do this.

The metals for dies and counters must be kept wide apart or the zinc die will have soft spots causing faulty plates.

Metal plates should be carefully cut to patterns, using soft sheet lead for the purpose, the lead foil must be worked upon the zinc die so that it represents *exactly* what is wanted in the finished plate, and without cracks or rough edges. When this is satisfactorily obtained, slightly warm the lead pattern to make it soft, and proceed to flatten out, *don't crease it*, but burnish it out with a round wood point, mark the top that you may know which side to work the gold from, and then cut exactly to pattern. Plates can be made with little or no waste, and without cracks or trouble in swaging as the gold is sure to be exactly the size required.

Plates are better if pressed by screw press than if hammered with the horn mallet, the sharp rugæ should be always chased up with bone points oiled, and pressed again after annealing. Investing material should be plaster, pumice and marble dust, equal parts by weight.

British Journal of Dental Science.

LONDON, OCTOBER 1st, 1890.

MECHANICAL WORK AND THE PUPIL SYSTEM.

INCIDENTALLY, in our last issue, we made some reference to the mechanical part of a student's training ; space, however, compelled us to postpone any lengthy consideration of this important question. The present seems to us an appropriate time to state our views on the subject, seeing that, from to-day onwards, mechanical work will be undertaken at our largest Dental Hospital, namely, that in Leicester Square. A work-room has been fitted up there, in the basement, with a number of benches, each having a separate nest of drawers for tools, &c., and an electric light for illuminating purposes. There are plaster and sand benches in another room, besides lathes and other requisites for mechanical work. In short, there will be excellent accommodation for a number of men working at the same time. In order that the apparatus may not be allowed to depreciate, the room has been placed under the charge of a fully competent workman, who will also help and guide the students in their work. We are not in a position to give full details of the scheme under which artificial dentures will be supplied to the poor, but we are assured it will contain ample safeguards against any abuse of this charity. The wisdom of this step on the part of the authorities is, however, not now our point, we wish to look at it solely from the student's point of view, and from this we regard it as an unmitigated good. Good as a supplement to the mechanical training gained dur-

ing the years of pupilage under some private practitioner, but bad, if it is in any way meant as a substitute for this. It is most desirable that each student should be obliged to do a certain amount of mechanical work at the hospital before his schedule is signed, and that this should be enforced and not allowed to be a mere print and paper regulation.

There has been a good deal urged lately against the pupil system, but we are bound to say the speakers appear to us to have utterly failed to make out their case. True, they describe what all too frequently exists ; but if a number of dishonest men let their responsibility to their pupils begin and end with pocketing the premiums ; it is no argument against the pupil system. We know one case in which a boy's articles with his father were running whilst the boy was yet at school ; we have heard another pupil of his father confess he never did anything at all in the workroom ; but because these fathers were foolish, because, when they signed their sons' schedules, they were willing to perjure themselves, certifying they had instructed their boys, though this was false, we say, this is no argument against the pupil system, indeed, it could be more urgently used as a reason for making all children wards of chancery. The fact is there is so much to be learnt in a properly regulated workroom ; so much that a man can learn from a private practitioner, who carries out his duty to his pupil in a generous manner, that we doubt, whether any man brought up under these conditions would forego this period of study if he had to live his professional life over again. We are thoroughly at one with those who can see nothing but waste time in a pupil sweeping floors and such like menial offices, but we think this might easily be checked were some rules to be drawn up for the guidance of parents about to article their sons, warning these to stipulate against this and similar practices in the agreement.

A recent speaker has advanced as a reason against mechanical training, the fact that the condition of their hands would be affected—now there is a wide difference between spending three or four years and a lifetime at the bench, and if delicacy

of touch is lost in this short time, even if prolonged work at the bench would do so, (which we are inclined to doubt), to be consistent, athletic exercises, as rowing, etc., should also be interdicted. The fact is with a liberal supply of oil, soap and water the hands need lose none of their suppleness, and the fingers will certainly gain in deftness by work at the bench. Indeed, there is a good deal of "blarney" talked about delicacy of touch, and perhaps those who talk most have least. It is, we fancy, another of those arguments on the principle *post hoc, ergo propter hoc*, which have so often landed the controversialist in a quagmire.

Our belief in a pupil system may be briefly stated to rest on the following statements:—

1st.—Mechanics must be learnt practically. The book-worm is no mechanic, his fingers are all thumbs.

2nd.—As a pupil a man gains an insight into the working of a practice which he cannot gain at the hospital. If the pupilage were abolished, he would have half of his work to learn when qualified.

3rd.—If the pupilage were abolished, the inevitable result would be to flood the profession, and the state of things would be, if anything, worse than the present crowded out state of the general practitioner.

There is much more that could be said on the question. We have by no means stated our own views in entirety, but our object is more to draw the attention of the Profession to the subject. It is quite upon the boards that sooner or later some such proposal will be made, and it is for each then to be ready with his arguments and opinions to support it, or to oppose it.

FROM the annual report of the Victoria Dental Hospital of Manchester, which we have now before us, we learn that the subscriptions for 1889 amounted to £86 10s. This seems to us to show an utter lack of support of this charity by the outside public, not at all in keeping with the reputation of

this midland capital, for even of this small amount, some, we note, is subscribed by members of our Profession. It appears that there would actually have been a deficit on the ordinary working expenses of the year, were it not for the students' fees, which seem to be paid to the credit of the Hospital. To anyone knowing the relief afforded to the suffering poor by these Dental Hospitals, and the value of sound teeth to the health of the patient, it is certainly astounding that some of the wealth, which is distributed on charitable purposes in Manchester, should not find its way into the coffers of the Dental Hospital. Surely something might be done by the members of the Staff enlisting the sympathy of their private patients, and by obtaining the assistance of the Press and of the prominent men of the City.

AN evening paper states, on the authority of a "French Dentist," that gold to the value of £100,000 is annually used in the United States for filling teeth, and from this the same gentleman calculates that in three centuries the cemeteries of the country will contain a quantity of gold equal to thirty-five million pounds. This gentleman must, we fear, have had a good many idle moments to have entered on such a useless calculation. Perhaps if he had more practice he would have learnt that, even if the fillings would last a life-time, the teeth do not, as a rule, and consequently, most of the gold will find its way back to the melting pot, long ere the patients go to their last resting-place.

ALL those who wish the Dental profession well will feel indebted to the *Lancet* for its logical and outspoken remarks on the relationship of Anæsthetists to unregistered Dentists. It says:—"We are asked by correspondents from time to time whether it is in accordance with professional etiquette for a member of the medical profession to give chloroform for a dentist who is not registered. It is more than a breach of professional etiquette—it is a moral wrong to the public.

An unregistered dentist is one who has no right to the title "Dentist," and can be fined for using it or representing, in any way, that he is a dentist; and such men are finding this out to their cost, thanks to the British Dental Association. Would our correspondents, who ask us this question, care to give an anæsthetic for an unqualified man who was a bone-setter, or be called in consultation with a herbalist or a prescribing chemist? It seems hard in these days of keen competition to have to refuse when you feel pretty confident that some other less scrupulous practitioner will reap the benefit; but it is some comfort to know that these unregistered practitioners of dentistry will soon be wiped out and a thing of the past."—The views expressed are so thoroughly in keeping with our ideas, that we could neither add to nor detract from them. We would, however, emphasize the fact that the point is registration—not advertising, nor any other disreputable practice, simply registration; so that, though a man may practise in the neighbourhood of Cavendish Square, though he may only have a name-plate upon the door, or no plate at all, yet, if he is not entitled to be registered, he who gives an anæsthetic for him is guilty of more than a breach of professional etiquette—it is a "moral wrong to the public."

WE are glad to note that a Dental Department has been added to the General Hospital of Launceston, Tasmania. Up to the starting of this department, there appears to have been no place, where Dental students could prosecute the studies imposed on them by the Dentists' Act of that Colony. At present the Department will only be open twice a week, under the care of Messrs. A. J. Hall and A. Lucadon-Wells, but we hope this may be the starting-point out of which a flourishing Dental School and Hospital will gradually grow. The advantages of the connection with the General Hospital must be obvious, but we hope the authorities will not hinder its growth by any ungenerous treatment such as might possibly arise from a non-appreciation of the importation of the

question. The Government has already appointed a Board of Examiners in Dental Surgery for the Northern part of the Island: it consists of four members — Drs. Maddox (chairman) and Pike, and Messrs. Hall and Wells.

ALL too often, we fear, medical men and dental surgeons are mulcted in damages for some untoward accident happening during an operation. In some cases, of course, the accident may have been due to culpable negligence, but, it is, perhaps more often to misfortune. It is therefore refreshing to find the practitioner turning tables on his patients, or rather expatients, and obtaining damages for the loss of reputation through use of slanderous language. This, Dr. Cruikshank, of Brooklyn, has just done, and was awarded sixteen hundred dollars, because the father of one of his patients had spread it about the neighbourhood that the doctor had treated his child for malaria when it had a different disease, also that the child would have been killed had not another doctor been called in. Besides, he affirmed, that the doctor was generally incompetent as a physician. The decision of the lower court was affirmed by the Supreme Court. This court affirmed that the physician need not prove the damages sustained, as this would be impossible, but the slanderous language being uttered, the damage resulting therefrom may be assumed. It would be interesting to know what part the "other doctor" played in the matter. We fear he did not show the same *esprit de corps* which we are glad to read of in connection with an attempt of the Horsham Guardians to reduce the salary of one of the medical officers by 12½ per cent. Mr Kinneir, the officer in question, refused to accept the reduction, but agreed to continue his duties till his successor was appointed. On the vacancy being advertised in several journals, not a single application was received. A proposition that the post should be again advertised was defeated by 10 votes to 6. A motion will be made to have Mr. Kinneir re-appointed.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

COMPRESSED COCAINE TABLOIDS.

Messrs. Burroughs and Wellcome send us a sample of their Compressed Cocaine Tabloids, each of which contains half a grain. This, we may recall, was the dose recommended by the Odontological Society. These are so well known and appreciated we do not think there is need to speak of them at length. They are efficient, handy to keep, and the dose used is always the correct one.

IODIC-HYDRARG.

The same firm also sends us a specimen of this new Antiseptic and Germicide, which is said to possess double the strength of Corrosive Sublimate. It does not precipitate albumen, nor act as an astringent, nor is there the same danger of absorption as with Hydrarg. Perchlor. Dr. Luff, Physician to St. Mary's Hospital and Lecturer on Forensic Medicine in the school, has experimented with it for some time and vouches for the above facts.

Abstracts of British & Foreign Journals.

TO MAKE THE SURFACE OF AN OLD GOLD FILLING ADHESIVE.

By Dr. I. WILSON MOORE, of Philadelphia.

Several years ago Dr. Moore was called upon to add a small portion to a large contour filling in an upper central incisor, to replace the corner of the tooth which had been broken off, some years after the filling had been inserted. The position of the required addition was such that he had either to rely upon the new and the old gold uniting firmly, or to remove nearly all of the old filling, which was large and in excellent order. In addition to the labour involved, there would have been considerable risk to the remaining portion of the tooth in its removal. He applied the rubber dam, and after carefully cleansing, with absolute alcohol and chloroform, the portion of the filling to be operated on, and thoroughly drying with bibulous paper and the hot-air syringe, he repeatedly failed to make the new gold adhere, although the surface was well roughened and such retaining-pits made as the case permitted. Presuming that this failure to unite was due to the presence of moisture, he resorted to the following expedient: He formed at the end of a fine probe a minute ball of cotton about the size of a large pin head, dipped this into alcohol and ignited it, allowing it to burn until the alcohol was partly exhausted, so as to have the flame more under control, and then held it immediately under the prepared surface of the filling, allowing it to remain until the patient gave sign of discomfort. This was repeated several times. He found that he was able to make the filling quite hot without inflicting more than bearable pain. He then proceeded to pack upon it the new gold and found that it united quickly and firmly, and the operation was completed without the slightest difficulty. In finishing the filling he severely tested the union, and found that it stood the test thoroughly, and when finished

the joining of the new and the old gold could not be distinguished. He had recently examined that operation, after two or three years' service : the two portions of the filling seemed to be thoroughly one. He had since repeated the same expedient with success. He thought that by these means not only was the surface of the gold thoroughly dried and cleansed, but that the little burs and fibres of gold raised by the roughening of the surface, and perhaps also the surface of the filling, were annealed, and the union of the new and the old gold thus facilitated.

He had found another use for this novel mode of applying heat. In using gutta-percha for inserting crowns, the gutta-percha occasionally becomes chilled before the crown is fully in place. To remedy this, Dr. Moore has his little ball of cotton all ready, and if the crown fails to go well home, the difficulty is overcome by a few moments' application of the alcohol flame to the crown, while in position in the mouth, without loss of time, with far less discomfort to the patient and with more satisfaction than by withdrawing and again heating it.

Cosmos.

A SIMPLE METHOD OF MAKING SPLINTS FOR FRACTURED JAWS.

By C. N. JOHNSON.

At the recent meeting of the Ontario Dental Society Dr. J. B. Willmott, of Toronto, reported two cases of fracture which he had successfully treated by very simple means. Instead of making the splint of vulcanized rubber or any of the usual methods, he employed the ordinary modeling compound used for taking impressions. The fractured parts were brought into position, the warm compound moulded about them, occlusion obtained with the opposite jaw. The compound was then removed, cooled, and trimmed smooth to prevent irritation. This was placed in the mouth the same as a rubber splint, and the jaws bound firmly together. In order to avoid the liability to break, the compound was strengthened by moulding it around a piece of stiff tin, cut sometimes in the shape of a horse-shoe to follow the curve of the jaw.

When the teeth are all in place and the jaws must be kept apart for feeding the patient, two pieces of tin may be used, one immediately below the upper teeth, the other above the lower teeth ; and between the two a tin tube is soldered, leading into the mouth opposite the incisors. This admits of feeding, and makes a strong frame around which to place the compound. The simplicity of this method must at once commend it to oral surgeons, and according to Dr. Willmott it is as effective as simple. In one case where he left the splint in the mouth five weeks, the compound had not deteriorated in the least.

The Dental Review.

TAKING IMPRESSIONS.

Dr. A. G. Bennett says :—As we all know, the dovetail *interdentals* spaces are the points of greatest difficulty. I have lately struck a method by which the most difficult partial impressions are greatly simplified. I had a very bad case, requiring the two laterals and a bicuspid, all the palatal surfaces being very bulging. I tried several of the usual methods, and failed. The question then occurred to me, Why not obliterate these spaces *by the teeth required*? So I first selected the teeth and ground them up, and after drying the adjoining surfaces, I waxed them in place with hard wax. I easily took the impression, afterward removing and placing the teeth in their positions. This method requires no articulating out of the mouth, simply putting the wax plate in position and flasking the case. This week I took an impression of a very difficult case for the two laterals, the other teeth being much denuded at the necks. I ground up the teeth, and simply sprung them into place, no wax being needed, and then very easily took a perfect impression. The advantages of this method are obvious. Besides dispensing with articulating and trying in, you can see exactly how the teeth are as to size, shape, and shade, and they cannot move out of place, being securely fixed by the impression. I would not recommend this method for universal adoption ; it is chiefly for difficult cases ; and in such I have found not only nothing better, but nothing half so good. It is especially applicable where there are small spaces. Where there are

spaces articulating three or four teeth, it is not so good. I have used it with gum teeth and plain teeth, but it is better for the latter. I set the teeth firmly against the gum as possible. They can be removed afterward, trimmed a little, and set up still higher by having them a trifle long at first.

Items of Interest.

NITROUS OXIDE AS AN OBTUNDO SENSITIVE DENTINE.

G. L. CURTIS, M.D., D.D.S.,

I have attached to a cylinder an apparatus which I have devised for the application of the gas, consisting of a flexible tube of sufficient strength to withstand the enormous pressure. The gas is forced, on opening the valve, through detachable tubes of various shapes and conveyed to the cavity, where it is applied by means of an automatic atomizer through a very small aperture.

After experimenting on myself for awhile, I became fully convinced of the efficacy of the device and the value of the idea. I then began to use it on others as the opportunity offered, and was delighted to find that previous observations of its effects were confirmed. Exhibited as indicated, I have employed nitrous oxide as a local anæsthetic many times in my practice, with the most gratifying results in every case except two, in one of which the patient was hysterical, and the other in such a highly-wrought state of nervous excitability that I was unable to apply the blast properly.

My experience is that sensation is perfectly restored to the obtunded tissue in from three to ten minutes after the application, in which respect the local action is very similar to that which follows the administration of nitrous oxide as a general anæsthetic. The duration, as also the degree, of the loss of sensation depends on the length of the exposure to the blast. So far, I have never observed any untoward after effects which could be attributed to the exhibition of the nitrous oxide. It appears to be entirely innocuous, after the temporary effect passes off.

Considering the comfort to the patient, the ease and satisfaction to the dentist when operating on the most sensitive tissue, and the rapidity of work thus rendered possible, as promised by the method described, it would seem to hold forth the hope of painless dentistry to thousands of sufferers who never visit the dental office, through fear of the torture they expect to undergo.

The advantages which I claim for this method, of producing local anaesthesia by nitrous oxide under high pressure, may be briefly summarized as follows :

The action is complete and certain. The tissues are deprived of moisture and perfectly obtunded.

Unless the application is pushed beyond all reason (which might result in the freezing of the parts) no injurious effect is produced on the tissue, as when ether, alcohol, chloroform or carbolic acid are employed.

The application is not followed by inflammation. The patient is not rendered unconscious by it, and there is no unpleasant odour or soiling of the tissues, so objectional in the use of the other agents.

The parts being perfectly dry facilitates the most careful examination.

Compressed or liquefied nitrous oxide is always available in the cylinders supplied to dentists.

Neither the nitrous oxide nor its action is affected by the temperature of the surrounding atmosphere, nor is it combustible or explosive.

International.

AN EYE QUACK IN BRUSSELS.

An Arab eye quack, Golam Kader, who has already made himself notorious in various continental cities, is attracting unusual attention just now at Brussels. From notices that have appeared in the Belgian journals by medical men, some of whom were permitted, under the guise of reporters for political newspapers, to be present at the proceedings, we learn that an empty house belonging to the corporation and the approaches to it are besieged by from 600 to 1200 patients at the time of the daily consultation. A reclamation operation for cataract was witnessed, the immediate success of which, as evidenced by the patient saying she should see the operators,

hands, produced a great sensation among the crowd. All the other patients, including cases of absence of the eyeball after excision, staphyloma, keratitis, and conjunctivitis, purulent as well as simple, were all treated by the application of a brush—which was never washed—dipped in one universal collyrium, several hundred patients being thus doctored in less than half an hour, all of them being given hope and told to come again the next day. It may be asked how is it that in a country where the practice of the art of healing by unauthorised persons is illegal—which, of course, it is not with us—a notorious and dangerous quack, such as this Arab, should be allowed, not merely to practise, but to use a house belonging to the municipality of the metropolis for his operations? The answer is humiliating enough—a duly qualified practitioner is said to be “covering” him. It is known in Brussels that Golam Kader was successfully prosecuted at Genoa for illegal practice some three years ago, and it is possible that the Brussels medical authority may have something to say on the matter. *The Lancet.*

MAKING FINE FILES.

It is sometimes found convenient in doing crown and bridge work to have very fine files of odd shapes, to dress up difficult places. I got my idea from an old jeweller's work, and it will be found useful. Dress up a piece of wood file shape, a half-inch wide, and glue to this a piece of emery paper, the grade of grain you wish your file. Next, shape your file as you wish it, of the best cast steel, and, before tempering it, pass your emery paper across several times, diagonally. Temper by heating to a cherry red, and plunging into linseed oil.

Items of Interest.

Dental News.

A course of lectures on operative dental surgery will be given weekly from October 6th till Christmas, at the National Dental Hospital, by Mr. G. Cunningham. The fee is two guineas and a half. Lectures will be devoted to:—1. The practical bearing of the recent investigation on micro-organisms. Rotary method of gold fillings. 3. Porcelain inlays in gold fillings. 4. Compressed gases as local anæsthetics. There is a chance that Prof. Miller may deliver the lecture on the first subject.

DEATH DUE TO TEETH EXTRACTION.—At the Warsaw District Court, Mr. Brykovsky, a dental practitioner, was recently tried for malpractice. A woman with an inflamed cheek had come to him to have a right upper tooth extracted. The operation was followed by enormous hæmorrhage, the patient being taken home in an unconscious state ; on the next day she died. At the necropsy, the right upper alveolar process proved to be fractured, an adjacent largish artery severed, and all internal organs bloodless. The medical evidence was to the effect that the patient's death was due to acute anæmia caused by the rupture of the vessel. The court concurring in the opinion, the practitioner was deprived of his licence, and, in addition, sentenced to a course of "church penance."

The *Dominion Dental Journal* announces that for the next four years, at least, a member of the dental profession will sit in the Provincial Legislature, as member for North Perth. Dr. Ahrens, the successful candidate, was born in the town of Berlin, in 1851, served as a student in the office of Dr. Wells, of Waterloo, graduated from the Toronto Dental College in 1878, and immediately after began the practice of his profession in the town of Stratford. As a dentist he has been very successful, and his popularity as a citizen may be judged from the fact, that he is the first liberal candidate elected in North Perth for twelve years. It is trusted that Dr. Ahrens, through the influence he will be able to exert as member of Parliament, will see that the rights of Ontario dentists are not infringed upon in any way, and that we shall have no more dentists licensed "by Act of Parliament."

The American National Association of Dental Examiners have recommended the following principles for incorporation in laws for the regulation of dental practice, or for the guidance of those framing them :

1. The creation of boards of examiners in each State.
2. The boards to be officially created by the constituted appointing power of the various States, the appointees to be selected from a number of names presented by the representative State societies; each State society at its annual meeting placing in nomination not more than two names for each appointment to be made.

3. Recognizing five years' actual practice at the time of the passage of the law as qualifying for the continuance of practice.

4. Empowering the examining boards to examine and grant certificates to non-graduates, provided the candidates present satisfactory evidence of having had at least five calendar years of instruction.

5. These and all other examinations to be both oral and written, and candidates to be also subjected to tests of practical skill.

6. Empowering the boards to examine graduates in dentistry.

7. Prohibiting medical graduates without special qualifications practicing dentistry.

8. Requiring medical graduates to have their special qualifications determined by the same tests as other non-graduates in dentistry (see No. 5).

9. Making failure to pass the required examination in any one branch sufficient cause for refusal to grant the certificate.

10. Making failure in the practical tests in either of the two general departments of dentistry work disqualification.

11. Expressing the opinion that examinations for the special degree in dentistry should be conducted by a board of examiners established by law in each state, instead of by faculties as at present ; and the belief that the power of great degrees must at length become vested in boards created for the purpose.

12. Conferring on state boards the power to revoke, for cause, a certificate of qualification previously granted.

APPOINTMENTS.

Mr. J. Mountford, L. D. S. Eng., to be Assistant Dental Surgeon to the Dental Hospital, Birmingham.

Herbert R. Bowtell, L.D.S. Eng., has been appointed House Surgeon to the Dental Hospital of London.

Walter S. Holford, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Assistant House Surgeon to the Dental Hospital of London.

British Journal of Dental Science.

No. 546. LONDON, OCT. 15, 1890. Vol. XXXIII.

A NEW LOW FUSING CONTINUOUS GUM.*

By GEORGE CUNNINGHAM, M.A. (Cantab), D.M.D.(Harvard),
L.D.S., Eng.

I THINK it will be admitted by almost every dentist that a well made and properly adapted artificial denture of enamelled platinum, or what is commonly known as continuous gum, is the nearest approach to the perfect substitute for the natural teeth. Yet this almost ideal achievement of the mechanical laboratory with which the name of John Allen will ever be associated, is, despite improvements both in materials and appliances, possibly even further from being a part of the every day practice of the ordinary dental laboratory than it was on its introduction some 40 years ago. The subsequent introduction of vulcanite, mainly because of its manipulative facilities and in spite of its inartistic deficiencies, was a death blow to the general adoption of the more artistic process. The stereotyped sectional gum block of the American and the improved pink rubbers of the European manufacturers may be taken as efforts to meet the as yet unsatisfied artistic instinct of the dental mechanic. This strange and somewhat anomalous state of affairs makes it worth while to consider in some detail the advantages and alleged disadvantages of continuous gum work, since, without some effectual simplification of the process, it is evident that it will never become part of the every day practice of the dental laboratory.

Let us consider what are claimed as the advantages of this method.

Firstly, *Theoretically*, continuous gum work possesses capabilities of adaptation of the size, the shape, the colour, the position, and the pitch of the teeth employed far superior to any other known kind of artificial denture, except perhaps that excellent and nowadays almost old-fashioned method

* Read before the Section of Odontology of the International Medical Congress, Berlin, 1890.

known as English tube work. *Practically*, it does nothing of the kind, but that is mainly from the fact that a proper selection as to shape, size, and colour of the special teeth requisite for the process is not to be found in the average well equipped dental laboratory, nor for the matter of that even in the most important depots, at any rate on this side of the Atlantic. This difficulty applies with almost equal force in these days to tube teeth, and is evidently entirely due to the correlation of the indisputable law of supply and demand. Probably this fact has contributed more than any other to the slow adoption of the process. The more general employment of the method, therefore, is to be looked for rather in the direction of adapting or of obtaining a body and an enamel applicable to the ordinary kinds of teeth, of which a fair, if not adequate, selection is to be found in the laboratory of most dentists, and certainly in most dental depots.

Secondly. The material of which the continuous gum is composed, possesses as great capabilities for the restoration of the features to their normal expression as either vulcanite or celluloid, while it far surpasses either of them as a material for producing an artistic imitation of the natural gums.

Thirdly. The combination of platinum and fine porcelain constitutes a denture which for cleanliness is unapproached by any other.

Fourthly. As to strength, adaptability, and its power of conducting heat and electricity, the platinum plate, which is the base of these dentures, possesses all the qualities of gold plate. It must be admitted that the colour of the metallic plate neither pleases the eye of the average dentist nor that of the average patient as does the so called nobler metal. Sentimental though this grievance may be, the colour of platinum is no less a real disadvantage, and paradoxical though the statement may seem, the recent rise in value of platinum by almost phenomenal leaps and bounds may not be an unmixed disadvantage, since in a few years it will probably be the nobler metal of the two, then this senseless objection to its colour will probably have disappeared.

Fifthly. With regard to its durability it cannot be worn out, though it must be admitted that its preservation requires more careful treatment than the ordinary dentures, the most frequent injuries being those which occur out of the mouth.

Sixthly.—With regard to its capabilities of repair it cer-

tainly is not as easily, repaired as for instance, an ordinary vulcanite denture, still the process of repair is not really difficult. There is, however, this additional advantage in favour of continuous gum work, that on proper completion of the repair the case is again equal to new.

On the side of its disadvantages, real or alleged, we will discuss the following points.

First. With regard to weight, bulk for bulk continuous gum is considerably heavier than any other form of denture. The mere weight of an upper denture is within reasonable limits a quantity which may be ignored, provided the plate is thoroughly well adapted to the mouth. Having worn at various times dentures of all kinds and combinations except aluminum and celluloid, I can confidently aver that I never was conscious at any time of any difference in the weight of the different appliances when in the mouth. The actual weights of four upper cases I have worn at different times with an equal absence of any subjective sense of weight are Vulcanite $\frac{2}{3}$; gold plate, with gum blocks, rubber attachments $\frac{3}{4}$; continuous gum (porcelain) $1\frac{1}{2}$, ditto [glass], 1oz. [avoir-dupois] or 8 : 9 : 16 : 12 :—Statistics of a few cases show that the weight of a full upper case in vulcanite is from $\frac{3}{4}$ to 1 oz. and in continuous gum from $1\frac{1}{2}$ to $1\frac{3}{4}$ oz. The new enamel is somewhat lighter. One of my patients, a public orator, has worn with comfort and ease for five years full upper and lower dentures of vulcanite each weighing $1\frac{3}{4}$ oz., in consequence of the mass of vulcanite necessary to restore the sunken features. I know an expert who wears a somewhat similar upper case with large plumpers all in continuous gum and the weight being about $\frac{1}{4}$ lb. These facts may serve to rectify the conclusions of some sceptical dentists who only criticise a case from its weight in the hand.

Secondly. With regard to that unpleasant clinking sound as the teeth are brought into occlusion, that is indeed a real objection, which however is only slightly, if at all, more apparent than in all dentures where mineral teeth are used.

Thirdly. With regard to the difficulty of construction, it is usually maintained that it requires greater skill and a higher order of talent than ordinary mechanical work. I firmly believe, both from my own experience and that of my students, that it presents few, if any, great difficulties to a really efficient dental mechanic; while to the dentist who is not only a mechanic, but, as he ought to be, an artist, it only

enables him to achieve greater artistic effects, by the increased facilities afforded by the superior capabilities of the materials employed in this process. One of the real difficulties in the present form of continuous gum work is, of course, the uncertainty of results, and the labour involved in the prolonged furnace work—a difficulty, however, which is very much greater to the beginner, or the occasional employer of the method, who is discouraged by such disagreeable incidents as gassing, crazing, cracks, unsatisfactory enamel colours, and so on. Despite the contention to the contrary by specialists, practical experience justifies me in maintaining that excellent continuous gum work may be done in a mixed gas and air furnace, such as Verrier's, which, however, seems to be capable of very considerable improvement. I have no experience of Fletcher's improved furnace for this work, which is capable of being worked either by an ordinary blower or with an oxy-hydrogen blast, but an examination of it justifies a favourable expression as to its efficiency, though, where a large amount of work has to be done, no such appliance can replace the ordinary coke furnace. A good volume of heat, as well as of temperature, is necessary for efficiently executing ordinary continuous gum work, which arises from the difficulty of perfectly vitrifying both the body and the enamel. The fact too that this point of vitrification of materials employed is usually so near that of the teeth themselves, that there is a danger of the latter turning out roughened and otherwise unsatisfactory. Here again it is evident that any important reduction of the time and labour involved in the process of firing, by a tangible reduction of the vitrification point of the materials employed, will be a distinct advantage.

Fourthly. It is usually stated that continuous gum work is not adapted for partial sets, and, while it must be admitted that this is true to a very great extent, I think that the favourable experience I have had of a few such cases, justifies me in saying that this general conclusion is probably due to the inherent difficulties of the ordinary methods, and, with the simpler and easier method about to be described, it has had its applicability to partial sets very greatly extended. To add a tooth to the ordinary vulcanite or gold denture, is easy of accomplishment, but it would be rare to find such an addition easy in the case of continuous gum.

Fifthly. It is, held even by many experts in continuous

gum work, that it is not so applicable to the requirements of a lower as to that of an upper denture. That opinion seems to be based upon two grounds ; Firstly, that the weight produces "irritation at points along the edges of the plate and frequently induces a renewal of the process of absorption along the whole alveolar ridge ; and secondly, "from the shape of lower plates they are more liable to accidents when out of the mouth, and they are far more easily broken even by use in the mouth than upper sets." My own experience in such cases is too limited to warrant my disputing the authority of the article on this subject in the American System of Dental Surgery, but, so far as it goes, I have experienced neither of these disadvantages.

Sixthly. A more serious objection is the fact that this method affords little opportunity for making those changes which are usually so necessary for the comfort of the patient during the first few days of wearing an artificial plate without marring the appearance of the denture. This objection of course applies in much greater force to lower than to upper dentures. There is, however, one method by which this can be controlled to a very considerable extent, and that is, by getting the patient to wear the denture or dentures for a day or even two, before the plate receives its final coat of enamel. Dr. Smith, the author of the previous quotation, suggests that where it is desirable to construct a continuous gum denture for the lower jaw, it will be found much better to make the adaptation of the plate with vulcanite. A remark, however, which is made later on in the same work, after describing how this may be accomplished, is not without considerable significance, "In regard to these combinations of contiguous gum and rubber it may be remarked that as the porcelain gum is usually cracked in places, either after the final firing or after the vulcanization of the rubber plate, and as repair is difficult and expensive, they cannot be recommended as well adapted for general use."

At the Annual Meeting of the British Dental Association in 1887, Mr. Cumming read a paper with the title which fitly describes the subject of my present demonstration, viz., "Continuous Gum Work with any Form of Make of Tooth." The novelty of Mr. Cumming's method consisted in his baking the ordinary artificial gum on platinum base apart from the teeth, which might be of the ordinary variety, and were finally mounted on a metal or rubber plate by the usual

process of vulcanizing. The whole process seemed to me so complicated that it presented little, if any, advantage over the ordinary method of continuous gum work. I am quite prepared to admit that this conclusion may have been an erroneous one, but do not think that even the inventor will deny that his claim, that it should be the *coming* process of continuous gum facing, has been realized. The numerous favourable comments, however, on the specimens then shown, warrant me in believing that you will regard the process I am about to describe to you with even greater interest, since it achieves all the objects of the Cumming method in a very simple way.

A reference to the formulæ for continuous gum work in that very interesting chapter on moulding and carving porcelain teeth in the American system of Dental Surgery, Vol. II. shows that they consist of ingredients of very different degrees of fusibility, and it seems to me that such ingredients as cryolite, Bohemian glass, flint glass, and "white glass," [whatever that may mean] are added for the purpose of reducing the fusibility or acting as a cement to the more refractory ingredients, such as silica or quartz, kaolin and spar. I therefore set to work and instituted a series of experiments which may be briefly described as the very opposite, that is, adding the more refractory substances, which for convenience of discussion may be termed "tooth frit," for the purpose of giving stamina and cohesion to glass as a basis. Having satisfied myself as to the possibility of making an artistic and natural reproduction of gum colour with mixtures of ordinary coloured glass and vitreous enamels of various kinds, and also the possibility of controlling the fluidity, if I may be allowed the expression, of the molten glass, I found from a consultation of technical literature on the subject, which is woefully unsatisfactory from a purely scientific point of view, that as we would anticipate, there is a very considerable difference as to the fusibility and the solubility of the various kinds of glass. After various and prolonged experiments which it would be tedious to detail, suffice it to say that I succeeded in turning out in this way an artificial denture of enamel platinum which enabled me to approach one of the highest technical authorities, namely, Mr. Harry Powell, of the celebrated White Friars Glass Works, London, with a view to interesting him in my experiments. I candidly told him how provokingly unsatisfactory the technical literature had proved, and asked

him to supply me with materials of known ingredients to replace the somewhat haphazard materials with which I had been working. In this way I was enabled to make very considerable progress, and after having satisfied him as to the utility of the process and the prospect that it might be of considerable usefulness, he very kindly placed his practical knowledge and technical skill at my disposal. By utilising a formula for that Mosaic work for which this ancient house is famous, we have succeeded in producing a body and enamel capable of fusing at a relatively low temperature. With regard to the artistic results achieved, the specimens which I now exhibit speak for themselves, even although the experiments are not yet complete. I think you will admit that, just as we match teeth, it will be almost as easy to match the natural gum which in different mouths presents an extraordinary variety of shades and appearances, from the pale anæmic gum to that purplish turgidity not unfrequently found to be chronic in many mouths.

After having referred to the extreme fusibility of this new enamel, you will doubtless be surprised that the specimens presented to you are mounted on a highly infusible metallic base. The new materials may be fused on copper, dental alloy and gold, but it was early discovered that there was so far only one material, namely, platinum, which was available, and that for two reasons. First, during heating chemical change takes place between one or more ingredients of the enamel and metallic base, such as, 18 carat gold, which has hitherto prevented my obtaining the natural gum colours on any other dental metallic base but platinum and pure gold. This change might possibly be obviated by using a glass which did not contain silicate of lead, but as there are other qualities to be considered such as durability, strength, and solubility it is considered that we obtain a stronger material, insoluble, or at any rate practically insoluble, in the mouth by keeping to the use of flint glass as the main ingredient.

Recent experiments on the behaviour of this vitreous enamel on various metallic bases afford a reasonable clue as to the cause of the change of colour in the vitreous enamel. Some of my specimens which will be presently exhibited prove—

- 1st.—That on pure gold there is no discolouration.
- 2nd.—That on silver there is a yellow discolouration.

3rd.—That on copper there is a black or greenish discolouration.

These facts seem to indicate, first, an oxidising of the metal under the influence of heat, and secondly, the metallic oxide, thus formed, imparting its colour to the vitreous enamel, either directly or by causing some further chemical change in the constituents of the vitreous enamel. A similar discolouration takes place with the alloys, and therefore, in 18-carat gold, we obtain so much discolouration, both from the copper and the silver it contains, as to preclude its use in this method. So readily is the vitreous enamel discoloured, that even on the pure gold specimen, the one or two tiny points where coin gold was used as a solder, or to close a small fissure in the plate, were distinctly marked by a deep green local discolouration on baking the body.

Secondly, the coefficient of expansion of platinum and glass being the same, platinum must possess practically obvious advantages, especially as to adhesion, over any other material. If it is desired to give the denture the more acceptable appearance of gold, it is easy of accomplishment as for instance by electro gilding. Another method, which is not uninteresting, is well represented by this specimen. The metal base is made by sweating a piece of pure gold and pure platinum together and rolling them out in the mills to the desired gauge, the enamel is infused upon the platinum surface leaving an exposed surface of pure gold. Mr. Powell was extremely surprised to see the adhesion of the vitreous enamel on pure gold; although the attachment is not so strong as in the case of platinum, it is evident that by stippling we can get sufficient attachment for the purpose, though that statement may have to be revised later on, as no practical case on gold has yet been worn in the mouth for any length of time. On dental alloy, as one of the specimens shows, the enamel simply flakes off as the specimens cool from the unequal contraction of the metal and the enamel. It is still necessary by this method to use pure gold for the soldering of the teeth to the platinum base, but soldering, however, is not absolutely necessary as demonstrated by this full set of continuous gum. Here the teeth were mounted as usual in wax on the metal plate, the case was then set, teeth downwards, on a base of plaster, sand, and fire clay, equal parts, the investment being carried over so as to embrace the tips of the teeth, and thus to hold them in position. The wax was then removed in the usual

way, and the body built up around the teeth, the purple colour which shows behind the front teeth in this specimen is due to a chemical action between the investment and the body, and indicates a danger, which, however, can usually be avoided. Although the enamel seems to adhere with tolerable firmness to the smooth platinum plate, it is better to increase its attachment by either stippling the plate or forming a boundary for the material by means either of a turned-up edge to the plate, or what I think is better, soldering a rim of triangular wire of platinum with pure gold; all of which processes are exemplified in this specimen case [full upper]. In this same case you will see that the enamel is equally applicable to English and American teeth, the front teeth being American and the bicuspsids and molars Ash's "diatoric."

For full, but especially for partial dentures, both upper and lower, this new enamel seems to afford a great and important sphere of usefulness for the excellent English tube work. One reason why this work is so little employed is no doubt due to the fact that too frequently the dental mechanic of to-day is lacking either in the ability or in the patience requisite in nicely and accurately adjusting the tube teeth to the plate. This fine fitting of tube teeth, which occupies even in the hands of an expert the greater part of the time of manufacture, is entirely obviated by the new method of working it. The plate is struck up in platinum, and, instead of gold, platinum pins are mounted in the usual way, only soldered with pure gold. No fine fitting of the teeth to the plate is necessary, as the body does that more effectually than the most expert manipulator of the corundum wheel. The use of sulphur cement and the working loose of the teeth is also obviated, since they are held firmly in position by the body and the enamel. The general excellence of ordinary tube work is further improved by the filling up of all spaces where food might lodge, without impairing in any way the utility and strength of the older method, the artistic colouring of the restored gum is I think a great advance on the often unsightly long rooted tube teeth.

I can confidently recommend, from an experience of quite a number of practical cases in the mouth, this method as being peculiarly applicable to tube teeth mounted on a platinum base, and also feel very certain that if the method is at all generally adopted it would be followed by the introduction of a new and improved form of tube teeth, which

practitioners in this country would at once recognise as being fitly described by the term diatoric tube teeth. These would have the improved form of the American counter-sunk teeth and the solidity of the English tooth-body without the unnecessary platinum tube. For our purpose such teeth would be immensely superior to the ordinary flat teeth, if only from their having that retundity of outline which is characteristic of the natural teeth. I have only made a few experiments with regard to the possibility of baking the body on a metal plate in a mould or flask such as we use for vulcanite. To efficiently carry out these experiments, would require considerable alteration in the muffle and oven, and, therefore, though I have not yet been enabled to attain success, I have reason to hope that it may yet be done.

As it is as well to show one's failures as well as one's successes, you will see from this specimen that I have so far failed in mounting a full continuous gum without cracks on a vulcanite base, but I will not admit that I should yet accept that failure as insurmountable.

For small blocks of a few teeth, I think it is evident from these specimens that the new method is of considerable utility and of artistic value in special cases. For small cases of bridge work, removable or fixed, this enamel seems to have a great field of usefulness.

With regard to the process of firing, I have had great difficulties, as no existing form of furnace was found exactly applicable to the dimensions of the ordinary denture. If, however, the profession adopt this method of continuous gum work, such difficulties will be easily overcome, as by constructing and adapting a platinum muffle to the ordinary small Fletcher's muffle furnace, I have been enabled to turn out the specimens which have been exhibited to you. The furnace is simply an ordinary draught gas and air furnace, and the whole process of firing can be accomplished in about a quarter of an hour, though it is sometimes advisable to take a little longer time.

As most of you know, annealing is not an unimportant matter in the treatment of glass, even one to two weeks being deemed necessary in some important commercial products. This, however, is most essential where these products have to combine strength with thinness. Without trying any prolonged annealing process, we have so far found very little difference in the appearance of crack in cases which have

been slowly or quickly annealed. If the piece is allowed to be cooled down in the oven, it may be a distinct advantage to allow it to do so slowly. In that case, it is well to close the chimney, as that retards the process of cooling very materially, by preventing a draught of cold air through the furnace. A lower case I am wearing now, was simply allowed to cool down in the oven. The blocks of four teeth were slightly annealed by being allowed to cool down in cotton wool, and other cases by cooling down in the even.

An effort has been made to more thoroughly anneal the upper case mounted on pure gold. After the case was sufficiently fired, the gas was turned down, so that it was retained for several hours at a temperature somewhat less than the firing heat, and then gradually allowed to cool down in the oven during the night. A more thorough annealing might be achieved by placing the case, after it had cooled sufficiently, in hot sand, hot plaster, or some hot fatty body, such as oil or stearine. Further experiments in this direction will be carried out. Meanwhile it is interesting to know that Mr. Powel is surprised that, considering all the circumstances of the case, cracks are not more numerous.

Glass, as we know it, is usually fashioned into objects of extremely slender proportions, and so firmly imbued is the human mind with the proverbial fragility of glass that it is not uncommon to find amongst the insane, that the afflicted individual imagines he is made of glass, and therefore he must not be touched, for fear of his breaking. Glass, however, is a material of very considerable strength, but much depends on the shape and form which it takes. A material, therefore, which is utilized in the arts, for roofing houses and paving streets, must surely have sufficient strength to be judiciously applied to the requirements of the dental art. Some dentists and experts have predicted that this material will not last in the mouth. The almost universal receptacle for fluids of all kinds, whether acids or alkalies, is a bottle made of flint or other glass. To all practical intents and purposes, this new continuous gum is flint glass, and, therefore, I think that the acknowledged fractional solubility of flint glass in weak alkaline solutions will not prove a serious drawback to the employment of the process.

The facility with which the enamel may be renewed and repaired, is evidenced by the smaller specimens exhibited. With regard to the production of different colours a very

considerable modification of each colour from a darker to a lighter shade may be obtained by means of rubbing down with a muller on ground glass, or the gum given a mottled appearance in other ways. As this, however, would lead me into details of manipulation, which would be tedious in a paper, I shall reserve these and other points for the demonstration of the process which I shall have the honour of making.

In conclusion it is important to note that I do not suggest this new material as superior to continuous gum work as used at present by experts, but I do claim from a short, though I think sufficient practical experience in my own practice that it is capable of replacing with advantage to the patient and with facility to the dentist, and that to a large extent even in partial dentures, some of the less artistic ordinary products of the dental laboratory.

ON THE AGENCY OF MICRO-ORGANISMS IN CARIES OF THE TEETH.*

By J. HOWARD MUMMERY, London.

WHEN called upon to open the discussion on this important subject I naturally felt some diffidence in undertaking the duty, a diffidence in no sense decreased by the knowledge that I should be speaking in the presence of experts who have made this subject their especial study. But for the expectation of being able to peruse in my own language the most important literary contribution to the subject of recent years, I should hardly have dared to undertake so responsible a task.

The unavoidably delayed translation of that work, and my meagre acquaintance with the German language, must be my excuse, if I appear to ignore any important point in the most recent development of the subject, or show a lack of appreciation of that record of painstaking investigation. Doubtless any such deficiencies will be fully remedied in the discussion which will follow, which I hope will be commensurate, not with the imperfection of my introductory address, but with the scientific importance and practical significance of the subject.

*Read at the International Medical Congress, held at Berlin, August, 1890.

In opening a discussion on the influence of micro-organisms in caries of the teeth I think the desired end will be best attained by venturing as little as possible on theoretical ground and drawing attention especially to the several points which are still debateable, questions on which competent observers hold somewhat different opinions. In order adequately to appreciate these points a brief historical *resumé* of the subject may be advisable.

While the discovery of the association of micro-organisms with caries and the dependence of this disease on their presence and fermentative action is of very recent date, the idea of some organisms being present was held, as is well known, in ancient times. Without dwelling on these early theories, I may allude to the worm hypothesis which held ground for a long period, taking the place of the theory upheld by Hippocrates, that caries, like other diseases, was caused by a bad condition of the humours. Whatever significance we may attach to this ancient worm theory, the first important point which strikes one in this historical aspect, is the question, whether the exploration of our special region (the mouth) may not legitimately claim to have been the means of anticipating, even by centuries, the dawn of bacteriological science, for in the volume of the *Transactions of the Royal Society* for the year 1684, appears a letter dated September 17th, 1683, from that great pioneer of microscopy, Anthony Leuwenhoeck, of Delft. It is entitled "Microscopical observations about animals in the scurf of the teeth, the substance called worms in the nose and the cuticula consisting of scales."

In this letter he says :—"Though my teeth are kept usually very clean, when I view them in a magnifying glass I find growing between them a little white matter as thick as wetted flour ; in this substance, though I could not perceive any motion, I judged there might probably be living creatures. I therefore took some of this flour and mixed it, either with pure rain water in which were no animals, or else with some of my spittle, having no animals nor air bubbles to cause a motion in it ; and then to my great surprise perceived that the aforesaid matter contained very many small living animals, which moved themselves very strangely. The largest sort were not numerous, but their motion strong and nimble, darting themselves through the water or spittle as a jack or pike does through the water. The second sort spun about like a top and were more in number than the first. In the third

sort I could not well distinguish the figure, for sometimes it seemed to be an oval, and other times a circle; these were exceedingly small and so swift that I can compare them to nothing better than a swarm of flies or gnats, flying and turning among one another in a small space.

Besides these animals there were a great quantity of streaks of threads of different lengths, but of like thickness, lying confusedly together, some bent and others straight. These had no life or motion in them."

There can be little doubt that the last named streaks were the familiar leptothrix filaments, and probably Leuwenhoeck also detected, as suggested by Dr. Miller, the well-known "spirillum sputigenum," which is found in abundance between the teeth near the margin of the gums, and exhibits a very active movement.

It is astonishing that, with the imperfect instruments of the day, this great observer should have so anticipated modern scientific discovery.

Ficinus, in 1846, describes caries as in part a putrefactive process caused by the presence of infusoria (denticola).

Klenke, in 1850, while agreeing with Ficinus as to the putrefactive variety, describes another form of caries in which a phytoparasite, which he calls *protococcus dentalis*, takes a part.

But the first systematic account of the action of micro-organisms in caries is that of Messrs. Leber and Rottenstein, in 1857, when they published their important *Recherches sur la Carie dentaire*, a contribution all the more remarkable when we remember it was published when scarcely any of the great discoveries in bacteriology had been made.

They describe caries as due partly to the action of acids, and partly to the proliferation in the tubes of the dentine of a definite micro-organism, the leptothrix buccalis; that the growth of this fungus in the substance of the dentine could not take place without a preliminary decalcification of the tissues of the tooth by acid. They found that the tubes of the dentine were dilated and penetrated by granular matter, and, finding that this granular matter stained violet when treated with iodine acids, they looked upon it as composed of the elements of the leptothrix fungus which proliferated in the dentinal tubes. They considered that although the preliminary stages were due to the action of acids, the appearances found were not sufficiently accounted for by the action of acids

alone, and were due in part to this proliferation of the fungus in the tissues.

They concluded that an acetous fermentation was set up in the mouth with particles of food lodged between the teeth, and in fissures in the enamel, and considered it probable that lactic acid was formed in this fermentation.

Professor Wedl, in his work on "The Pathology of the Teeth," published in Vienna, in 1870, discusses Leber and Rottensteins's views; he considers that the leptothrix described by these authors has no direct connection with the origin of caries. The extension of caries in the dentine he believed to be effected by the acid, and not by the fungus. He says, "The proliferations of the elements of the fungus, without doubt, penetrate and expand the dentinal canals, but according to my observations, this cannot occur until the decalcification of the dentine is complete, or, at all events, until the first stage of this process. I have never detected a proliferation of fungus in the still hard, carious dentine."

He concludes that "caries of the teeth is a process which has its origin, chiefly, in the abnormal secretions of the gums, and likewise in those of the rest of the oral mucus membrane and of the salivary glands, and commencing at suitable points on the exterior of the tooth, spreads in the direction of the pulp cavity. In consequence of the decomposition of the secretions, acids are formed which extract the calcareous salts from the hard tissues, and give rise to a disintegration of the affected portions of the latter, in which no inflammatory action occurs. The destructive process is promoted essentially by the accumulation of secretions and particles of food, and opportunity is afforded for the proliferation of leptothrix buccalis, in the dead and softened dentine."

We meet for some time with no further important researches in this direction. The existence of a micro-organism in caries had been demonstrated, and from the microscopical appearances in carious tissue, it had been assumed that this micro-organism (supposed to be exclusively the leptothrix buccalis) participated in the pathological process; acids produced in or taken into the mouth, having prepared the way for its advance by a preliminary of the tissue.

At this point in the history of the investigation, the influence of micro-organisms as an agent in the production of caries, was, at all events in England, practically disregarded, notwithstanding the researches of Leber and Rottenstein—

the view that held the field at this time being the purely chemical theory of caries.

At the meeting of the International Medical Congress in London, in 1881, Messrs. Underwood and Milles communicated an investigation into the effects of organisms on the teeth and the alveolar portions of the jaws, which, together with the subsequent important researches of Professor Miller, has resulted in placing the facts of the action of micro-organisms in caries on a thoroughly accepted basis.

They considered that "caries is absolutely dependent upon the presence and proliferation of organisms." "That these organisms attack first the organic material, and feeding upon it, create an acid which removes the lime salt, and that all the differences between caries and simple decalcification by acids are due to the presence and operation of germs."

They demonstrated the existence of micrococci and rod-shaped bacteria in the dilated tubes of the dentine, and by submitting healthy teeth to septic and aseptic fluids in flasks, proved that in an aseptic flask caries never occurs, in a septic flask, a change, at all events greatly resembling it, frequently does occur. As stated by Mr. Charles Tomes in the discussion on this paper: "In former experiments on the production of artificial caries, germs had not been excluded, and consequently had exerted their full action; but Messrs. Underwood and Milles showed that when they were excluded, caries did not occur, and he considered that this was "a contribution to our knowledge of the artificial production of caries, which can never be left out of consideration by any subsequent observer, or writer on the subject."

It still remained to be shown what was the acid produced by the micro-organisms, and in what way it was formed in the mouth. The first place in this investigation belongs to Professor Miller, of Berlin, who bringing a sound knowledge of chemistry to bear upon his researches, conducted a series of important experiments, which have done a great deal to clear up this portion of the subject, and to establish it upon a thoroughly scientific basis.

He found that fresh saliva mixed with sugar or starch invariably became acid in four or five hours—whether the experiment was performed in the mouth by means of a small tube attached to a tooth, or out of the mouth, the mixture being kept at blood temperature; when the saliva was subjected to a temperature of 100° before mixing with the starch,

no acid was produced. When the starch alone was submitted to a much higher temperature than this, acid was still produced, showing that the ferment was in the saliva, and not in the starch. By other experiments it was proved that the ptyalin of the saliva was not the cause of the acid re-action. By inoculating a sterilized solution of saliva and starch with carious dentine, or with saliva taken direct from the mouth, acid fermentation was produced, proving the existence in the mouth and in carious dentine, of an organized ferment capable of producing an acid reaction. By control experiments it was proved that sterilized cultivation tubes *invariably* became acid when inoculated direct from the mouth, the uninfected tubes remaining neutral. It was also shown by conducting similar experiments without the access of air, that, given the necessary food, this action can go on in the deeper layers of the dentine excluded from the air—in other words, that some of the organisms found in caries were anærobic. Other experiments tended to show, that by the use of strong antiseptics in the mouth, combined with careful cleansing with tooth brush and silk, the amount of acid produced in specimens of saliva, tested, could be greatly reduced.

All the cultures made, showed under the microscope a fungus, either micrococci, diplococci, bacteria, bacilli, or thread forms. Dr. Miller described all these forms as sometimes found on a single thread, which he considered to prove the genetic connection of the forms. He also concluded that it was only from carbohydrates, especially sugar, that this fungus appears to be able to produce acids in any considerable quantity at all. He finds, furthermore, that the "great majority of the fungi found in the human mouth are capable of producing acid from cane or grape sugar. In nearly all cases investigated this acid appeared to be lactic."

One link in the chain of evidence was, however, still wanting—could caries be produced out of the mouth artificially, imitating the conditions found in the mouth as nearly as possible? Dr. Miller answers this question in the affirmative, and has been able to produce artificial caries which is undistinguishable from natural caries under the microscope.

Messrs. Underwood and Milles, in a further communication contributed to the Odontological Society in 1884, described some experiments on the production of artificial caries in which the results obtained were not identical with Dr. Miller's.

In their first experiment, malic and butyric acids were present in a flask with an infusion of meat and saliva, fragments of dentine were exposed to this fluid ; but the change produced was only quite superficial, although the tubes were enlarged and contained a material that stained readily. It has been suggested, that in this experiment the necessary food of the micro-organisms was absent, for albuminous substances, such as meat, when decomposed in the mouth do not produce acids. They required starch or sugar as the material from which to form the acid.

In their second experiment, in which putrefactive changes in the materials were allowed to go on for a considerable period, scarcely any perceptible change took place. It has been since suggested as an explanation of this result, that putrefaction causes an alkaline reaction, and interferes with the acid-forming properties of the micro-organisms ; an instance of putrefaction interfering with caries is seen in those cases in which a growth of suppurating gum has partially filled a large carious cavity, the caries is often arrested and the reaction at the margin is found to be alkaline.

In a third experiment, in which fragments of dentine were exposed in a flask to a mixture of saliva and bread, a change was produced in the dentine, but Messrs. Underwood and Milles considered this change to be a very weak caries, if caries at all. In connection with this experiment it may be remarked that if the mixture was not often renewed the micro-organisms might soon be devitalized by their own products, so that while we should obtain decalcification, there would be no infiltration with micro-organisms. They came to the conclusion, as the result of these experiments, that the process to be effective must be carried on in a living mouth, probably because that is the only situation in which the special germs are really active.

The researches, thus described, enable us to formulate a definite explanation of caries in relation to micro-organisms. It is now well established, as first stated by Messrs. Leber and Rottenstein, and confirmed by Messrs. Underwood and Milles, Miller, and other observers, that in all cases of caries, micro-organisms are present, and without their presence caries never takes place.

The phenomena in dental caries may be divided into two stages ; the first being a process of partial decalcification, and the second a stage of digestion and solution of the tissue.

The first stage of caries consists in a partial decalcification of the tooth substance by acids, these acids being formed in the mouth by a process of fermentation; this fermentation being the result of the action of micro-organisms on the sugar present in the mouth, either taken in as such, or as starch which is converted by the ptyalin of the saliva into sugar. Prolonged contact of the micro-organisms with the teeth is necessary to the first stage of caries, either by the lodgment of particles between the teeth, or in fissures or depressions in their substance.

In the second stage of caries, such decalcification having occurred, the micro-organisms are able to penetrate the softened tissue, and feeding upon the sugar present in solution, form fresh acid in its substance, and especially in the tubules of the dentine, proliferate freely, expanding and dilating the tubes until they break into one another, destroying the matrix and causing complete disintegration of the tissue. According to Dr. Miller, several germs of the mouth possess the power of dissolving albuminous substances and changing them into a soluble modification, and he therefore considers the second stage of caries to be a digestion process; the cartilage of the tooth being dissolved by a ferment similar to pepsin, just as albumen is by the pepsin of the fluid of the stomach. The same observer has never found a putrefactive organism in the deeper portions of carious dentine, and he does not consider putrefactive changes at all *essential* to caries. "The presence of putrefactive organisms, while it would accelerate the second stage of caries, could only retard the first." The acid formed in this fermentive process, appears from the investigations before described to be in most cases lactic acid. The power of forming lactic acid from carbohydrates appertains to a large number of species of bacteria (Flügge).

It is well known that the growth of the bacteria is injuriously affected by the products of their own tissue change. Lactic acid, in the lactic acid fermentation, is injurious even in the amount of 0.8 per cent. (Flügge). In experiments with lactic acid bacteria it has been found necessary, when the formation of lactic acid has reached this proportion, to neutralize the acid with chalk. There is evidence, that in carious teeth the lime salts liberated form with the acid a lactate of lime, thus taking up the excess of acid formed and allowing the fermentation to go on unimpeded, the micro-organisms being set free from its inhibitory effects.

Microscopical Appearances in Caries.

We have to consider the microscopical appearances in enamel, in cementum, and in dentine :—

In Enamel.—The enamel loses its transparency and the prisms are seen to be separated from one another; the elements of the fungus are only seen in the spaces formed by its disintegration, as there are no channels in its substance along which they can penetrate, its structure, in fact, does not admit of the proliferation of micro-organisms in the tissue. A dark colouration of the enamel is generally to be noticed.

Dr. Abbott, in a paper published in the *Dental Cosmos*, in 1879, in describing the decalcified portion of carious enamel, speaks of the readily stained masses of softened substance as protoplasmic bodies “embryonic corpuscles,” which the change in the enamel, caused by caries, has brought into view. He considers this, as also a similar appearance in carious dentine, to be evidence of a high vitality in the tissues.

Other observers consider that these are irregular masses of germs mixed with the detritus of the decayed tooth, that not being homogeneous they take up the colouring matter unequally at different parts and produce a false appearance of cells (Miller).

Caries in Cement.—When caries extends to the cementum, the organisms are found in the lacunæ and extending along the canaliculi.

According to the observations of Dr. Miller, the Sharpey’s fibres in the cement become infiltrated with germs and dilated and the tissue lying between them dissolved.

Caries in Dentine.—The structure of dentine is eminently suitable for the proliferation of micro-organisms, and it is in this tissue, accordingly, that their effects can be best studied. If we examine with a low power a longitudinal section of carious dentine in a tooth, in which the decay has commenced from a fissure in the crown, and which has been treated with fuchsine or gentian violet, it is noticeable at once that the stained portion has more or less the appearance of a cone, the most deeply stained part forming the base of the cone, corresponding to that portion of the dentine which formed the floor of the cavity of decay, and that the apex of the cone is directed towards the pulp cavity of the tooth.

On examination with a higher power, it is seen that the

micro-organisms, usually either micrococci or rod-shaped bacteria, penetrate freely along the tubes of the dentine, in the more superficial portions being crowded together, and in the deeper layer of the tissue filling the tubes less completely, in some cases being reduced to a single line. The base of the cone is seen to be formed by the extension of the micro-organisms in a lateral direction along the fine terminal branches of the tubuli. The tubes are seen to be expanded at intervals into irregular globular or oval shaped spaces filled with micro-organisms; in many cases large cavities appearing where these have become confluent. These cavities breaking into one another, the whole tissue of the dentine becomes broken down and gradually destroyed. We frequently see groups of canals filled with organisms lying in the spaces of the dentine apparently free from infection, in other cases, the matrix seems to have disappeared and the whole of the dentine in the part examined is found to be a mass of micro-organisms. *Leptothrix* threads are especially noticeable on the margins of the preparations, where their invasion of the decalcified tissue is marked by bundles of threads penetrating for some distance into the dentine.

Specimens are met with where the *leptothrix* threads penetrate the tubes to a considerable depth, some specimens showing *leptothrix* threads throughout, to the exclusion of other forms. Mixed with the *leptothrix* filaments are often seen small round points which may easily be mistaken for micrococci; these are cross sections of the *leptothrix* threads and may be seen by altering the focus of the objective. Cocc- and short rod-shaped bacteria are, however, the forms of micro-organisms usually found in the deeper layers of the dentine. In many specimens some tubes are found filled with micrococci, others in their neighbourhood filled with bacilli, and according to the observations of Dr. Miller, single tubes are found in which both micrococci and rod-shaped bacteria are seen. Interglobular spaces, so often found in teeth immediately beneath the enamel, play an important part in caries by increasing the porosity of the dentine and leading to its rapid disintegration in a lateral direction; being one reason of the undermining of the enamel so common in caries commencing at the masticating surface.

Dr. Miller describes germs as penetrating into the interglobular spaces, but in the many specimens I have examined, showing these spaces, I have never seen them occupied by

stained micro-organisms, those contained in the tubes seeming to be arrested at the interglobular spaces, and it does not appear as if they proliferated within them. Some specimens show a curious transverse splitting of the matrix at right angles to the tubes, oval spaces being formed having a very characteristic appearance.

Mr. C. Pound, of the Bacteriological Laboratory at King's College, London, who has cut and examined a great number of specimens of carious dentine, says, he has always found these oval spaces in teeth with dead pulps, and recognises a dead tooth by this particular appearance. I do not know how far this observation has been corroborated by other observers.

According to Dr. Miller there is always present in carious dentine, a zone of softened tissue in advance of the line of micro-organisms, separating the healthy from the infected tissue, this zone not corresponding in outline with that of the area infected. Messrs. Underwood and Milles, however, failed to detect any softening in tissue not attacked by micro-organisms, any tissue that was penetrated in the least degree by a sharp point, exhibiting these organisms under the microscope. They also inoculated nutrient gelatine with portions of the dentine taken from the extreme limits of the softened part, and found that an abundant growth of micro-organisms took place.

They therefore came to the conclusion that although, as these organisms secreted an acid capable of softening dentine one would *a priori* expect to find a softened zone, it was very difficult to demonstrate, and if present, it existed to a microscopical extent only. In his latest work, Dr. Miller mentions as evidence of the existence of this zone, the fact that longitudinal sections of carious dentine stained with fuchsine, show large unstained portions of the tissue at the sides of the preparation. These specimens are evidently softened sufficiently to cut, although they contain no germs. The germs spread more quickly in the direction of the canals than sideways, as in this direction they can only make way through the narrow transverse branches of the tubuli, but the decalcifying acids can infiltrate the tissue in this direction with ease.

The same observer states that germs are able to penetrate into the tubuli of the normal tooth. The diameter of a tubule being larger than that of a micrococcus, there is no mechanical impediment to the penetration of germs, and with a high

magnifying power a small number are sometimes seen, an advance guard, so to speak, which have penetrated into the normal tooth structure, without causing any changes in it. In absorbing milk-teeth germs are frequently seen to have penetrated into the open tubes for a short distance (Miller).

An appearance is often met with in longitudinal sections of carious teeth, the cause of which is not understood with any certainty. Short disconnected rods are seen, some lying scattered about in all directions, and others still within the tubes, lying at different angles to one another, like a pile of bricks in the act of falling. It is possible that these are casts of the tubes, especially as they disappear on the addition of dilute sulphuric acid (Miller). "They may on the other hand be portions of the consolidated fibrils, or of the sheath of Neumann which has broken up in this manner" (Tomes).

In transverse sections the tubes are seen cut across and crowded with micro-organisms, and largely increased in diameter at the expense of the matrix. In many parts three or four tubes have run together, the matrix and parietes of the tube being destroyed.

There are some appearances in cross section which are difficult to explain. When several of these expanded canals approach one another they exhibit prismatic or angular forms the intertubular substance having disappeared, but the limiting wall remaining intact. It is difficult to account for the disappearance of the matrix unless, as suggested by Dr. Miller, the germs form a pepsin-like diffusible element, which dissolves the intermediate substance, while Neumann's sheath is still intact.

Transverse sections also exhibit a peculiar condition, which has been described as the tobacco pipe appearance. Rounded masses of apparently homogeneous substance, which stains deeply, are seen to occupy the much expanded tubes, and in some specimens, micro-organisms in fine thread form, are seen running between and around them, leaving a clear circle of tissue uninvaded by the threads. This latter appearance is seen more frequently at the margins of the preparations where leptothrix forms are most abundant. It seems to be a kind of secondary encroachment of these thread forms on the matrix.

The Micro-organisms concerned in Caries.

According to Leber and Rottenstein the leptothrix buccalis, which is found abundantly in the mouth in the form of

long thin threads and felted masses, is the principal organism concerned in dental caries.

This was disputed by later observers, although Dr. Miller, in a paper in the *Int. Practitioner*, speaks of a fungus which appeared as either micrococci, diplococci, bacteria, bacilli, or thread forms, and describes all these forms as sometimes found on a single thread, which he considered to prove their genetic connection. But he nevertheless admits, that while there occur in the mouth both monomorphous and pleomorphous forms, stable forms, and forms that exhibit different transition stages, the majority of the micro-organisms found in caries are monomorphous.

Dr. Flügge, *Micro-Organisms*, English Edition, p. 393) says :—"It is evident that the designation leptothrix cannot be employed as a generic term, for the most various kinds of bacilli may produce these thread-like formations, and the threads which occur in the buccal secretions and in the deposit on the teeth, are probably nothing more than the thread form of various well-known, or still unknown and widely distributed bacilli.

"It is possible, for example, that bacillus butyricus not uncommonly takes part in the formation of leptothrix in the mouth ; it is probable, however, that many other bacilli, more especially anærobic bacilli do the same."

He points out that leptothrix threads do not appear to belong to one individual species, showing variations in thickness, flexibility, &c., and that the bacilli which have been isolated from the mouth by cultivation are not the forms which produce the leptothrix ; or may it not be possible that the same micro-organism which would produce threads in the mouth, might fail to do so under changed and artificial conditions ?

Recently Dr. Kreibohm (*Centralblatt f. Bacter.* vii., 1890), came to the conclusion, both from microscopical examination and from cultivation, that leptothrix merely represents a peculiar phase of growth of different shizomycetes ; he found four forms to develop leptothrix, two of which were bacilli, and two short bacteria.

Dr. Miller in his last work says, "In short, the name leptothrix buccalis, does not apply to any germ with distinctive characteristics, and the name does deserve to be retained since it has only been the expression of a confused and erroneous view."

Of twenty-two kinds of germs from the mouth isolated by Dr Miller in 1885, ten were in the form of cocci (showing very different dimensions), five appear as shorter, six as longer staffs. One species formed spirilla, another grew out into long threads. Of thirty species cultivated subsequently, eighteen were cocci, eleven staffs, one formed threads. In fluids, three grew to long connected or unconnected threads, one formed spirilla, eight were motile, fourteen motionless. He could only discover spore formation in three, the others seemed to propagate themselves by transverse division.

They showed great variations in their relation to oxygen, ten only grew while there was free entrance of air, four grew better when exposed to the air, but could grow without it, eight seemed to grow well whether with or without oxygen. Eight produce colouring matter in gelatine cultures some days old, forming brick-yellow masses, such as may be seen occasionally on the buccal surface of teeth which are not kept well cleaned, the colouring matter being in the protoplasm or cell membrane, the cultivation medium not being coloured.

In the pigmentation which occurs in caries the germs remain colourless, while the tooth itself is coloured. These colours are not seen in early stages of caries, but only when it is far advanced, and usually when it is of a slow or chronic nature. Organic substances decomposed by micro-organisms assume a dark colour, and in experiments, which Professor Miller has made on this point, he has detected iron in these discoloured teeth.

He says, "Whether in caries of the dentine and enamel, the iron salt is formed in sufficiently large quantities, for the discolourisation to be ascribed to that source has not yet been decisively ascertained."

Of the germs especially characterized by the formation of lactic acid in the mouth Dr. Miller has separated by cultivation twelve. He finds that "a great majority of the fungi found in the human mouth are capable of producing acid from cane or grape sugar, and it is probable that with very few exceptions, all can, when the proper conditions are presented to them.

He finds also that "the same fungus may produce an acid reaction in one substratum and an alkaline in another," and says, "In such a case we undoubtedly have two distinct pro-

cesses going on, first, the nutrition of the organism accompanied by the appearance of alkaline products ; secondly, its fermentative action, accompanied by acid products." He further points out that "under the various conditions and with the numerous fungi present in the human mouth the reaction may occasionally be neutral or alkaline, and this would give a temporary check to the advance of the caries." He considers that many of these fungi have a peptonizing action and that a number both possess this action, and are both capable of producing acid by fermentation of carbohydrates, and thus may be capable of producing the phenomena of caries in the mouth.

M.M. Galippe and Vignal claim to have isolated six kinds of micro-organisms taken from the tubules of dentine. They thus continue :—Among these six kinds we have always met with four in every one of the eighteen we have examined. We have met with another kind eight times, and with a sixth five times. (1) The first kind constantly met with is a short, thick bacillus, not forming chains. (2) The second kind is a bacillus, which is about twice as long as it is broad. (3) The third kind is a bacillus, which is very like the preceding one in appearance, except that it has no constriction. (4) The fourth kind is a very short, very thin bacillus, nearly as broad as long ; at first it would be taken for a coccus. (5) The micro-organism, which we have met with eight times, is a bacillus, which is rounded off at its ends. (6) The micro-organism, which we have met with only five times, is a rather large coccus. Dental Record Vol. IX. 1889.

The micro-organisms owe their rapid development to the secretions, deposits, &c., of the oral cavity, and not until the tissue of the tooth has undergone a certain change, first decalcification, second peptonization, can they adapt it to their nourishment. The decalcification is produced chiefly by acid, resulting from the action of the organisms upon certain carbohydrates in the human mouth, while the peptonization is produced either by the direct action of the protoplasm of the organisms upon the decalcified dentine, or by the action of a ferment which they produce. In the study and separation of the different germs in the mouth, the mass of material has been so great and the opportunities for error so varied, that it has been found impossible, with few exceptions, to classify them or decide their conditions of life. There is still an immense amount of work to be done in this direction, and this

can only be accomplished by investigators who will take up the study of separate species and work out their individual life history.

Our more complete knowledge of the morbid changes in dental caries throws great light upon the predisposing and exciting causes of the disease. Sugar being the food of these acid forming micro-organisms, all foods containing sugar, or starch, which is converted into sugar in the mouth, tend to increase the liability to decay of the teeth.

Some interesting observations of Dr. Miller's on this point show that the acids formed in the mouth by cooked starch are at least as destructive to the teeth as those formed by sugar. Saliva containing starch shows at blood temperature acid reaction in as short a time as that containing sugar, and in equal quantity. He points out that starch and starch-containing substances are more hurtful than sugar, because sugar being easily soluble soon flows away and is thus rendered harmless. Starch clings longer to the teeth and thus exercises a more enduring action than sugar. This is confirmed by the observations of Hesse on decay in bakers' teeth. Vegetables seem to be less fermentable in the raw state than when cooked, hence the cooking of food would seem to have an injurious effect in causing caries. Meat when decomposed in the mouth does not produce acid, and the observations of my father and others, on the agency of the food in the causation of caries, show that races whose food is confined almost exclusively to meat show a very low percentage of decay. Dr. Black's researches, however, point to a different conclusion, he says (Article on "Etiology of Caries, American System of Dentistry," vol. 1, p. 730) :—"Races of men who have eaten largely of acid fruits have had less decay of the teeth than those who have been debarred by their position or climate from the use of such articles of food. Generally those tribes that have subsisted largely on meat and grain have suffered more from caries than those that have had a more exclusively vegetable and fruit diet."

From the conditions of fermentation in the mouth, one would certainly expect to find more caries in vegetable and starch eaters generally, than in flesh eaters, but as Dr. Black says, "Our knowledge is too meagre to warrant any lengthy discussion on this point."

An irritated condition of the gum giving rise to an acid secretion is supposed by several writers to be a cause of caries,

but this is disputed by Dr. Miller, who points out that in pyorrhœa alveolaris, where an irritated condition of the gum exists for months, caries seldom occurs, and where decay does occur in cases where there is considerable congestion and separation of the gum at the neck of the tooth, it may be explained by the lodgment of food.

Among the predisposing causes of caries, defective structure holds the first place; deep fissures and cavities in the enamel, imperfections in the dentine, especially interglobular spaces (increasing the porosity of the tissue) irregular position of teeth leading to the retention of food, are other predisposing causes. Many diseases which give rise to an acid reaction in the mouth must be included among these, especially also diseases giving rise to dryness *e.g.* typhoid.

A predisposition to decay of the teeth is said to be inherited. Dr. Miller considers that this is only possible in so far as the inheritance of ill-developed and irregularly placed teeth is possible.

The surgical treatment of dental caries by the thorough removal of the diseased tissue, the treatment of the cavity with an antiseptic, and the insertion of a material which by its density and applicability to the walls of the cavity shall thoroughly exclude the germs, is, so far as our present knowledge goes, the most complete cure for the disease.

We can scarcely maintain, however, that with the most careful manipulation every germ is removed, but any that are left under a tight fitting plug are cut off from their food supply and their further growth prevented, seeing that they are probably incapable of attacking dentine in the absence of carbohydrate.

The incorporation of antiseptic materials in fillings has lately received some attention and perhaps more may yet be done in this direction. Whatever the care taken by the operator we must all now and then meet with those most unsatisfactory cases where in spite of the most careful treatment decay rapidly progresses and filling seems to be only a partially successful mode of treatment. In such cases there is no doubt usually an undue porosity of the tissues of the tooth.

As to means of prevention, germicides, which can be used in the mouth of such a strength that they are not injurious to the system, have no very great penetrating power. The fermentative action of the micro-organisms at the bottom of

cavities and fissures in the tooth is not interfered with by any mouth wash. In the mouth the difficulty of applying any thorough antiseptic treatment is very great, we may seal up a disinfectant in a pulp cavity very effectually, but it is impossible to obtain any prolonged and complete disinfection in the cavity of the mouth, such as is necessary for the prevention of caries. Thorough cleansing of the teeth is the most effectual means of preventing decay, and the experiment of Dr. Miller's above referred to, shows that by the use of antiseptic mouth washes, combined with thorough cleansing with tooth brush and silk, the amount of acid produced in the mouth may be very greatly reduced.

The great science of bacteriology which has revolutionised medicine in the last few years, and which even now is hardly past its infancy, has added a new interest to our specialty. It has given us a much clearer understanding of the true pathology of disease, but in our own department, valuable and important as have been the contributions to our knowledge, it can scarcely be maintained that our understanding of the role of the microbe in dental diseases is yet complete, much must remain to be discovered where much is still obscure.

Adequate investigation in a special subject like this can only be carried out by those who have qualified themselves for the task by a sound practical training in the general sciences of bacteriology and chemistry; while in the wider subject of general pathology we see a small army of original investigators, in the limited area of dental pathology there are but few who by their researches can claim to rank as bacteriologists.

It is within the power of the younger members of the profession so to qualify themselves that they shall be able to contribute their share to the accumulation of well digested facts by carefully conducted experiment and deduction.

In the words of Professor Huxley :—"The known is finite; the unknown infinite; intellectually we stand on an islet on the midst of an illimitable ocean of inexplicability. Our business in every generation is to reclaim a little more land, to add something to the extent and the solidity of our possessions."

IMMEDIATE TORSION.*

By P. A. LINNELL, L.D.S. Eng.

Mr. President and Gentlemen,—In treating of my subject this evening, I purpose making my remarks as concise and practicable as possible, in fact it hardly permits of a lengthy or elaborate paper being constructed upon it, and I must apologise to you for making such a small matter the subject of a paper which, I think, ought to have taken more the form of a casual communication ; still, if I may claim your indulgence for a few minutes, I think it should give rise to a little discussion, and it will prove interesting to hear from those of our members present to-night their experience or their views, that we may consider carefully the merits and demerits of this little operation. I have kept notes of all the cases of immediate torsion which I have undertaken, together with models of the mouth both before and after the operation, and with the help of these I hope to be able to show you that in *certain cases* this quick regulating process may be undertaken with every confidence by the operator, and with every chance of a successful termination.

By immediate torsion we understand the sudden forcible twisting of a tooth into its right position in the dental arch by means of forceps. We must first consider what cases are suitable for this operation, and the first question that arises is that of age—at what time should it be undertaken with a hope of success? My reply to this is, as early as possible. Seven years is the earliest time at which I have operated, and from this age up to nine or ten appears to be the best, as the tooth is then fully erupted or nearly so, and the alveolus is not very dense or unyielding. I may add, however, that I have performed it as late as 14 years, but beyond this I should hardly like to venture, although Mr. Tomes records a case in which he successfully operated at the age of 15.

The next point to be considered is in what irregularities is it permissible? Of course it can only be undertaken in those cases in which an upper lateral or central incisor is standing rotated on its axis, but otherwise occupying a normal position in the dental arch. Either the mesial side may be directed towards the palate, or it may be turned towards the

* A paper read before the Manchester Dental Hospital Students Society.

lips, and this may occur either in one or both teeth, one being twisted in one and the fellow tooth in the other direction.

In our selection of cases we must be very careful to notice whether there will be room for the crown of the tooth when it is turned. If there is any doubt about this, it can easily be tested by taking a model of the mouth, and when cast in plaster, cutting off the malplaced tooth, and placing it in the position you wish it to occupy when twisted. It is also very important to ascertain as far as possible the position of the apex of the fang, for as you will know from ordinary cases of regulation, this point will remain fixed, or nearly so, while the crown will move in an arc of a circle, the centre of which lies at or very near to the apex of the fang. So that if we find the root points in an abnormal direction we should not gain a very satisfactory result by attempting to forcibly rotate that tooth as the crown, when in its new position would not range regularly with the surrounding teeth.

Should the fang be at all curved, a condition which we cannot unfortunately ascertain beforehand, this will of course preclude any attempt at torsion. As an illustration of this I have a case here in which I attempted to operate and failed and I think it must have arisen from some such abnormality of the root. It occurred in a girl aged 12 years, in which a right upper lateral was standing rotated on its axis. I pass the models round, and I think you will agree with me that it seemed a very favourable case for immediate torsion, as with the exception of this one tooth the arch presented a very regular and excellent condition. However, after applying great force in the manner I will describe presently, it refused to move to the slightest extent, and I was obliged to abandon the attempt. Of course this may have been due to the dense and unyielding nature of the alveolus, although one would not expect to find it so resisting at this age.

We must now proceed to the manner of performing the operation. This I will only just briefly go over, as I have no doubt most, if not all of you have seen it performed, and are well acquainted with it. I may at once say that I consider it advisable in all cases to administer an anæsthetic, nitrous oxide being admirably suited to our purpose, for our patients must necessarily be young, and the force to be exerted sometimes is so great that we could hardly expect them to submit to it. Those who successfully employ cocaine

would no doubt find it very useful in these cases. In fact, I have myself used it three or four times. The instrument used to grasp the tooth with should be a pair of straight incisor forceps, and in order to prevent injury to the enamel, the blades should be wrapped round with some soft material. Lead foil answering the purpose very well.

The tooth being seized by the sides which allow of the firmest grasp, is slowly and steadily turned in the direction desired until it is felt to yield, and as soon as this happens, it can be moved into place very often by the fingers alone. I may just mention, in passing, that a central incisor from the shape of its root requires far less force, and yields much more readily than a lateral. Tomes, in his "Dental Surgery," in speaking of this subject, says that the tooth is liable to spring back on being released, and for this reason should be twisted somewhat farther than necessary. This, I think, will only take place in those cases where the tooth has been turned to a very small extent. But in the majority of cases the rotation of the tooth breaks down the intervening tissue between the tooth and socket, and in this respect differs from the rotation of a tooth by means of a regulating plate where the process is very slowly performed, the tissues not being broken but put on the stretch, hence the great importance of a retaining plate in these cases, which is not required in the immediate process. At the time of operating there will be a good deal of hæmorrhage but this entirely ceases as soon as the tooth is in its new position.

The bleeding arises no doubt from the rupture of the vessels of the alveolar dental membrane, and is afterwards arrested by the tooth on one side and the alveolus on the other forming a firm compress for it.

We must now pass on to the after treatment, and this is very simple. Having placed the tooth in the position you wish it to occupy, you get your patient to bite into a small piece of gutta percha; this forms a most admirable and efficient splint very simple to adjust, and easily removable by the patient. This need only be worn for 24 or 48 hours at the longest, removing it at meal times and at night, and instructing soft food to be taken for a day or so.

Silk is sometimes employed to fix the tooth by being passed round it, and fastened to neighbouring teeth; but this is liable to occasion some little trouble of the gum, so making our chance of success less secure. The gum over

the root may be painted with aconite and iodine to subdue any little periostitis that may be set up. The patient should then be seen again in the course of a day or two, when in the majority of cases you will find very little, if any, pain has been experienced, and the tooth will be moderately firm. The splint can now be discontinued, the gum painted again, and the patient advised to see you at regular intervals for a week or so, when the tooth can be watched, and any trouble taken in hand at once, should it arise. If it does arise, it will be due in a great measure to carelessness on the part of the patient. Tomes mentions an unfavourable case in which necrosis ensued from want of proper care and attention after the operation.

Coleman in his book strongly deprecates this operation of immediate torsion, and appears to do so on the strength of one case which came under his notice, and which ended in necrosis. It was done, he informs us, by an operator of great eminence, but whether proper attention was given afterwards we are not able to tell.

There is another point I may just mention here, and that is, that in several of the teeth operated upon, I have noticed their colour has become of a whiter hue, but in the course of a few weeks they have invariably regained their normal colour. Whether this is due to a diminished supply of blood or a total arrest, I cannot at present say, but I should think very probably the former.

And now, gentlemen, I will show you one or two cases that I have selected from amongst those I have undertaken, which I think will illustrate my foregoing remarks. I will only very briefly describe them, that I may not occupy much more of your time with this not very interesting subject.

Case I. Girl, aged 12 years.—Right upper lateral twisted as in model. Operation performed as previously described, but no anæsthetic used.

Two days afterwards tooth firm, no tenderness.

Second model taken a week after operation.

Case II. Girl aged 11 years:—Left upper central standing as in model $\frac{1}{2}$ grain cocaine injected. In five minutes operation performed, very little pain felt. Impression Composition used for splint, which broke on following day.

Two days after tooth fairly firm, slightly tender.

Two months later the right upper lateral was turned into position, gas being administered. Two days afterwards splint was removed, tooth firm, no tenderness.

Case III. Girl aged 8 years :—Right upper lateral standing as in model $\frac{1}{2}$ gr. of cocaine used. Operation caused little pain. This tooth was tied with silk. Three days afterwards tooth quite firm, ligatures removed.

One month later the second model was taken, the tooth and surrounding parts being in excellent condition.

Case IV. Girl aged seven years :—Right upper central malplaced, gas administered, right lateral extracted, and central turned into position. Progressed favourably, and a month afterwards the second model was taken.

Case V. Girl aged 14 years :—Left upper central as in model 8. Gas administered, lateral extracted, central twisted.

This case progressed very satisfactorily, and a plate was inserted to force out the canine, when this was nearly accomplished the patient disappeared, and I was unable to complete it.

These cases which I have selected from amongst others very similar, show us I think that immediate torsion can be undertaken with a hope of success. And for central incisors I should not hesitate so perform it whenever a favourable case presented itself. Laterals I consider require a little more care in their selection, although I have not yet seen one go wrong. If by these simple means we can relieve our little patients from the tiresome and tedious process of wearing a regulating plate for many weeks, I think we are justified in giving them the benefit of it. And I may also say in conclusion that it seems to me if a tooth can be removed entirely from the jaw and replaced, or if a tooth can be implanted in the alveolus with any hope of a favourable termination, one, on the other hand, that never leaves its socket and is surrounded by healthy living tissue which is simply ruptured to a slight extent, ought to have a far greater chance of retaining its vitality.

I have purposely abstained from touching on any theories as to whether the pulp vessels and nerves are lacerated and afterwards become united to their trunks, but I have kept as I stated at the commencement entirely to the practical considerations of the case, and must leave you to read about these theoretical points in the papers of Mr. Cunningham. And now gentlemen having shown you these cases I must leave you to say whether you approve or disapprove of this mode of procedure.

British Journal of Dental Science.

LONDON, OCTOBER 15th, 1890.

IS A HIGHER DENTAL DIPLOMA NEEDED?

THERE is much talk just now about the need of a higher dental diploma, and the marked ability of some of its advocates has raised it to a position of importance, of which it is hardly worthy, but which compels us to give it more than mere passing notice. Unfortunately, the real points at issue have been obscured by an endeavour to compare the proposed higher dental diploma with the medical diploma of the conjoint Colleges. Even if the former were established on any basis which has hitherto been suggested, the two things would be so different in scope, in purpose, and in results, that it becomes quite useless to attempt any comparison. No one of the dentists, who at the present moment hold the conjoint medical diploma, has ever dreamt of affirming that it constituted a higher degree in dental surgery. It is important that this should be borne in mind. The obtaining of a medical, in addition to the dental diploma, is an advantage to all, and almost a necessity to many, and supposing, for the nonce, that a higher diploma in dental surgery were instituted, that would not in the least do away with the need of a medical diploma, nor would it serve the same purpose. Hence, the arguments for or against the higher dental diploma must be established on their own footing without reference to the additional medical diploma taken by many dentists.

In trying to arrive at a decision on the matter, the first questions naturally asked are : What good will it do, and

whom will it benefit? Will it benefit the profession in its relations with the public? Will it benefit the profession in its relations with the medical? Will it benefit the profession as a whole? or will it benefit individual members? Let us take these questions *seriatim*.

Firstly, it will scarcely benefit the profession in its relations with the public. They are just beginning to appreciate the fact that the L.D.S. is a guarantee of a certain amount of professional ability and education, and the establishment of another degree will surely lead to confusion and misapprehension. This is well seen in the medical profession itself, where the public are totally ignorant of the relative values of the different degrees, and are often misled by a multiplicity of letters. We may well take a lesson from our brother professionals, and avoid their errors.

Secondly, the establishment of a higher dental diploma will not raise the status of the dentist in the eyes of the medical profession. They will not esteem our specialty any the more because a certain number hold a specialized degree somewhat higher than their fellows, nor will it bring us more into touch with the medicals. This last can only be done by our joining them in their studies and examinations, in fact, becoming ourselves medicals as well as dentals.

A higher degree in dental surgery will not benefit the profession as a whole, for if it is to be established at all, it must be of such a high standard as to be obtainable by only the smaller number of the profession. Now this will inevitably lead to two things; first, the depreciation of the L.D.S., or the degree of the majority; and secondly, the splitting up of the profession into two classes—a higher and a lower. As matters now stand, all qualified dentists are on an equal footing, and beyond the respect entertained for those members who have distinguished themselves by their efforts for the advancement of our Science, either in its surgical or theoretical aspects, we recognise no superiority or inferiority.

Finally, it may indeed be said, that it would benefit a few individual members. There are, without doubt, a certain class of men to whom self-improvement is impossible, without

some external stimulus, something to work for, as they would say ; but we would fain believe that these are very few in number, and that the great majority of the profession need no such stimulus to urge them on in their efforts, not only for their own improvement, but also for the advancement of that Science to which they have devoted themselves. The respect and praise of our fellow-professionals so freely and so generously given, is surely sufficient guerdon for all our efforts in this direction.

In conclusion, we hardly need to point out, that all our legislation must tend towards securing the greatest good of the greatest number, and until it can be proved beyond dispute that the establishment of a higher dental diploma is necessary for the benefit of the great majority of the profession, even its most ardent advocates will cry in vain.

The British Medical Journal has made a new departure. It is issuing a Supplement, which will form a weekly epitome of current medical literature. This is, indeed, a welcome addition to this already valuable Journal which deserves, and will no doubt obtain, the thanks of its many readers. Journalism has now developed into such huge proportions, thought and research are now so active, that it is absolutely impossible to keep in touch with all that is going on, even if the barrier of "foreign languages" were removed. These epitomes, therefore, whether they take the form of a supplement or are brought into the body of the Journal as "Abstracts," are especially valuable.

There is a widely spread feeling that the Dental Profession should have some representation on the Medical Council, and indeed in a land which boasts, that the fundamental principle of its laws and justice is, that every man is tried by his peers : we say it is little short of absurd that the body which rules over us should be deprived of the assistance of one of our number. The death of Dr. Matthews Duncan has created a vacancy on

the Council which we should dearly like to see filled by the appointment of a Dental. One name will readily suggest itself as being eminently fitted to be brought forward, namely, that of Sir John Tomes. We fear, however, that he will hardly care in this, the evening of his life, to assume fresh burdens and responsibilities. In default of Sir John, we think that his son Mr. Charles Tomes, F.R.S. commanding, as he does, the confidence and respect both of the medical and dental professions, should be put forward as a candidate. The appointment is in the gift of the Privy Council, hence any men who have influence with its members, should utilize them, remembering, perseverance commands success.

A curious old book has just come into our hands, kindly lent by Mr. Rutterford, which already in the year 1816 had reached its fifth edition. It is entitled "A Dissertation on Artificial Teeth," by M. De Chemant. Apparently its object was to act as a kind of advertisement for M. De Chemant, since his address is printed in a very prominent manner; indeed he devotes a page to informing those persons, who may desire to consult him on the subject of his mineral paste teeth, that he would be obliged to them if they would, on the preceding day, make their appointment, etc. etc.—We fancy it would be a case of the "pot calling the kettle black," were we, of this generation, to find fault with this comely old gentleman (his portrait is given) for so doing, unfortunately it is now-a-days more the rule than the exception for those, who rush into print, to let their address occupy a prominent position, in the book, though, perhaps, they do not so openly (should we say honestly?) let the real why and wherefore of the book's appearance be seen.

The chief point of interest in the book centres in a sheet of engravings illustrating the various types of dentures which M. De Chemant was prepared to supply to his patients.—Here is a porcelain bridge of ten teeth supported by four pivots by which they are fastened to the stumps remaining in

the jaw. A single tooth for all the world like a Logan Crown. A single tooth to be fixed by means of a small plate of gold, or, as we in this inventive (sic) age would say, a bridge for one tooth. A row of teeth to be supported by ligatures ; this idea we would suggest to some of those inventive genii, who are hard up for something to patent. We do not for a moment wish to detract from the merit due to those who work out original ideas, because someone else has done it all before. But does it not seem a waste of energy ? Whether the fact be due to lack of reading on the part of the re-inventor or to our librarians letting their collection of books be but a miscellaneous heap of curiosities, not a classified collection with a general index and guide, we do not know. We remember reading somewhere, that in one of the German Universities there is a general index to the whole library, from which a man can see at a glance what has been done in each branch of study, so that it is possible to continue a line of research from the point where the last man left off, without wasting time going over the old ground.

Very interesting it is to be brought once again in contact with the famous medical men of the beginning of the century. Here we meet John Hunter, who introduces De Chemant to one of his patients and these six cases of transplantation followed by "venereal disease" which led him to give up "this cruel practice" are mentioned. Here again too the "immortal Jenner," in whose presence and for one of whose patients he removed fifteen or seventeen stumps, decayed even unto the socket. Here too, Sir Walter Farquhar, M. Vicq D'Azyr, and others.

M. D. CHEMANT, speaks of these teeth as his invention and thus records the circumstances "to satisfy the curiosity of the reader" :—

"In 1788, when I exercised the profession of a surgeon, I was consulted by a lady who had fallen into such a state of weakness as produced considerable fears of her life. On

approaching her I, perceived a tainted odour, which I thought proceeded from her lungs or her teeth, which were black. I examined her mouth, and was struck with the bad state of a set of human teeth implanted on a base of the tooth of the hippopotamus. This set of teeth being removed, I perceived her mouth to be almost entirely covered with small ulcers, and I had no doubt but that her disease was the effect of the putrid exhalations which proceeded from the set of teeth, and which corrupted the air she breathed ; what confirmed this conjecture was, that after having laid these teeth aside, her health improved in a few days. Perceiving that this lady would not do without artificial teeth, I advised her to have several sets of teeth at the same time, so that she might change them often, after having washed them and let them dry. She did so and her health became perfectly re-established in the course of some months.

But as teeth of this kind require to be renewed frequently, they occasion a very great expense, and even, notwithstanding their frequent renewal, they always produce a bad smell. I was induced from that time to reflect on the possibility and the means of making teeth and sets of teeth of durable and incorruptible materials. I examined almost all the substances of the mineral kingdom, and at length composed a paste, which, when it is baked, has every desirable advantage."

Now, as a matter of fact, or rather, according to Piggot's "Dental Chemistry" they were discovered by an apothecary of St. Germain, Duchateau by name. He wore artificial dentures of ivory and natural teeth, but found they rapidly became tainted by the various disagreeable odours emanating from his wares, the porous animal substances becoming rapidly impregnated by the effluvia. Mr. Guerard undertook the manufacture in 1776. Sets were made for various distinguished personages, but he failed from want of knowledge in the practical duties of a dentist. In 1788, Dubois Chemant bought the right, and managed to attract the attention of the French Academy, who appointed a sub-committee to examine the teeth. This committee found various imperfections in the teeth, a fact which, by-the-bye, M. de Chemant does *not* record in his book, and one of its members, Dubois Foucou, improved them very much. Practically, little alteration has been made in this substance even in modern times.

Abstracts of British & Foreign Journals.

INDIVIDUALISM.

From an Opening Address at St. Mary's Hospital Medical School,

By M. HANDFIELD JONES, M.D.

INDIVIDUALISM is not eccentricity; it is not mere singularity; it is not coarse ambition. Scientifically considered, individualism is the higher evolution of the atom or unit; viewed from a social standpoint, it is a process of intellectual development by which a man is marked out from his fellows. Individualism implies concentration of thought, tenacity of purpose, and a strong sense of self-reliance. It is the religion of the strong man, the master principle of his whole existence.

The great enemy to individualism is laziness, and those who know anything of human frailties will, I am sure, bear me out when I say that "mental" laziness is far more common and far more difficult to overcome than that of the body. It is so much easier to accept dogmatic teaching, and to shift the responsibility of our views on to others, rather than to consecrate our thoughts and work out the lessons of our own observations; it is much more pleasant to butterfly from theory to theory than to seek truth with patient tenacity; why trouble ourselves to learn self-reliance, when natural indolence protests against the sacrifice? It is easier to imitate than to originate; plagiarism and mimicry are prominent features in our lives. I will define genius as the highest product of individualism, and I will add that while few human beings reach genius, no human unit is without his share of individualism. Moreover, the more I study the life of a so-called genius such as Hunter or Newton, Faraday or Darwin, the more I am struck with the enormous amount of work they contrived to compress into one short life.

I am firmly persuaded that no student has reached the first stage of progress until he has subordinated reverence for great names to a profound respect for his own individual

opinion. Pray do not misunderstand me ; I am not advocating disrespect for our teachers, but I would rather a student formed an erroneous diagnosis and stuck to it, provided always he could give me his reasons for having formed such a judgment, than that he should accept my dictum as a teacher without challenging me for the grounds on which I ventured to differ from him. A man has made a tremendous stride when he has learnt to have the courage of his own convictions; he has passed the Rubicon of his medical career, when, for the first time, having honestly formed an opinion and adhered to it, the sequel proves that he was right and his teacher wrong. He finds that his first difficulty is not in forming a correct diagnosis of the disease, but in maintaining the conviction of his own opinion in the face of an unconfiding patient, suspicious relatives, and competing *confreres*. The student who believes in his own opinion will take trouble to perfect himself in those means by which alone he can arrive at a correct judgment ; the student who begins by criticising his teacher's diagnosis will find more and more that his view coincides more and more frequently with his teacher's.

I am often struck with the marvellous courtesy shown to us teachers by our student friends. The clinical physician gives a detailed account after lengthy and patient auscultation) of certain complicated murmurs, and then five or six gentlemen advance with their stethoscopes, and after a brief and rapid examination *confirm* all that the professor has said. Our great physician poet (Dr. Oliver Wendall Holmes) has parodied the scene most perfectly in his Stethoscope Song. From personal experience I can speak to this point, for in one case where, by way of experiment, I demonstrated the foetal heart over an ovarian tumour, some seven gentlemen kindly confirmed my suggested diagnosis. Perhaps I may be permitted to add that occasionally I have had some little difficulty in determining whether mental inertia or an excess of courtesy was predominant in the mind of my clerk.

I cannot resist pausing here to express my regret that the modern system of medical examinations handicaps our students so heavily in the development of individual thought. Mr. Edmund Owen, in his recent presidential address to the Harveian Society of London, humorously compared the head of a student of average ability to a quart pot, and bitterly complained that the examining boards expected it to do the impossible feat of containing and retaining three pints—one

of medicine, one of surgery, and one of midwifery. He pointed out, too, that the usual way out of this difficulty was for the student to go up and empty out his pint of Surgery, coming down again for the remaining quart of medicine and midwifery. Paradoxical as it may seem, I must express my conviction that the three pints could be easily accommodated in the said quart pot, if the three liquids were not so frightfully adulterated with useless theories and vexatious hobbies.

It largely depends on the quality and nature of the final examinations whether our men are turned out overstocked repositories of examiners' special fads and gifted exponents of the latest passing theory, or whether they be men trained in the habit of exact thought and rational practice, gifted in the use of the stethoscope, the scalpel, and the other armamentarium of their craft.

CITY vs. COUNTY.

One of the greatest mistakes many newly-fledged licentiates make, is rushing to the cities to settle. There are circumstances which justify some in choosing a city career in beginning; but it is a mistake to suppose that there is either less money or fame in a country practice. A beginner in the city has to compete with numerous and old-established practitioners; he has to begin with a maximum of expense and a minimum of income; he is tempted, when practice comes slowly, to cheapen his fees and lower what might become a good reputation. Unless he has capital to fall back upon, he must undergo no small share of worry in trying to make both ends meet; and at best, he frequently finds at the end of ten years, that he is financially no better, if not worse, than when he started. It has been a struggle against debt and difficulties and maintaining appearances.

On the other hand, there has been scarcely an exception to the success of young men who began in the country and the smaller towns. It is safe to say that by far the most prosperous, and certainly the healthiest, among our licentiates, have been those who hung out their "shingle" in our villages, and whose income, in spite of lower fees than prevailed in the cities, has almost invariably exceeded their outgo.

The provinces have a score of places with populations varying from 2,000 to 3,500 with no resident dentist. Nova Scotia, with its English population, has many small towns which badly need a dentist.

(Editorial "Dominion Dental Journal.")

Review.

Fletcher's Practical Dental Metallurgy (new edition) 1890.

When one considers that the art of dentistry is, in some measure, dependent for its very existence on metallurgical science, a knowledge of that subject would seem to be indispensable to the Dental Surgeon in the due performance of his duties.

The task of acquiring this knowledge is, however, by no means an easy one, for in the many excellent text-books on metallurgy, the facts which he particularly needs are involved in such a mass of irrelevant matter that it requires much resolution not to give up the search for the needle in so large a bundle of hay.

Mr. Fletcher, in the little book now before us, has met this difficulty, and given us a most useful collection of eminently practical notes on those subjects which most concern us. In plain type and on good paper is set forth a clear and concise account of the various metals with which we have to work, their sources, properties, and those of their chief alloys, interspersed with odd bits of information of use in the surgery or workshop.

Under the head of "Gold" are formulæ for plate, bands, wire and solders, with clear and simple instructions for its purification and assaying, for its preparation in the crystal form, and for the colouring of the finished work. A few extracts will suffice to show the scope and character of the work.

The following is stated to be a "rough and perfectly satisfactory way of reducing dirty filings and waste to good working gold. Boil it in a cast iron enamelled cup, with about three times its weight of strong nitric acid, to near dryness, adding a little more acid—say about one-third the quantity first used, and boiling down again. The residue must now be washed with hot water, and what remains after washing melted with borax in a crucible. This gives a gold about equal to the bulk from which the filings were made, and is both simple and certain in its results."

Here are some practical hints for forging fine steel instruments.

"These must never be heated in an ordinary blow-pipe flame, as it ruins the quality of the steel. Direct the jet downwards on a block of charcoal, and heat the steel with the rebound of the flame from the charcoal, which gives a saturated bath of carbonic acid. In the absence of charcoal, heat in the white part of the flame of a common lighting burner, do not heat too quickly, and work at the lowest temperature possible, hammering until nearly cold. Harden by sticking the point into a tallow candle."

An alloy of zinc and tin, we are told, "in almost any proportion is superior to zinc alone for dies. The impression from the sand is much finer, the shrinkage in cooling is greatly reduced and is more equal. Two zinc and one tin will probably be found the best proportion. Owing to the low temperature at which this alloy melts care must be taken to have the dies perfectly cold before pouring the lead for the counter die, and the lead must be barely hot enough to pour and not sufficiently hot to char a slip of paper."

That most interesting question of the composition and behaviour of amalgam fillings receives its full share of attention.

"Platinum gives to amalgam the property of rapid hardening. It communicates to amalgam also the power of retaining its form after hardening, provided it is in sufficient quantity; but in this case it also causes a dirtiness in mixing in the hand, which can only be remedied by adding a larger proportion of fine gold. Copper can only be considered an inferior substitute for platinum, as it imparts only to a very slight extent, the permanence of form given to platinum."

"Pure palladium, if obtainable at a reasonable price, is the best matter known for plates for artificial teeth, owing to its high specific heat, its extreme lightness and hardness, requiring no alloy, and also to its absolute freedom from tarnish."

"Alloys containing tin and silver are always exceedingly different to make uniform, more especially if, as is almost invariably the case, the silver contains a trace of palladium, and they are never reliable for dental purposes without thorough and systematic testing for all required properties."

Yet another drug is suggested as possibly useful for nerve treatment, viz., tungstate of soda, as it has "an exceedingly powerful tanning and hardening action on animal tissues. Leather when treated with tungstate of soda, and more

especially before it has been tanned by the ordinary process, becomes as hard as wood."

Such jottings as these, with some "addenda" on the use of the blow-pipe, and tables analytical and otherwise, complete a very useful note book.

Dental News.

The Hon. George Le Fevre, M.D., M.L.C., has been appointed a Member of the Dental Board of Victoria in the place of R. F. Hudson, M.D., whose resignation has been accepted.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.—The first entrance scholarship of 100 guineas has been awarded to Mr. M. Molloy and the second of 50 guineas to Mr. J. R. Langley.

A DENTIST who was called in to attend upon the Nizam is said to have received for drawing a couple of His Highness's molars the handsome *douceur* of 8,000 Government rupees.

LECTURERS AT THE ROYAL COLLEGE OF SURGEONS.—The professors and lecturers at the College of Surgeons for the present collegiate year are as follows:—Professors, surgery and pathology: Reginald Harrison, William Anderson, and James Berry. Comparative anatomy and physiology: Charles Stewart, Benjamin Thompson Lowne, William Watson Cheyne and Charles Bagge Plowright. Erasmus Wilson Lecturer, John Bland Sutton. Lecturer on Anatomy and Physiology (Arris and Gale), John Rose Branford. Bradshawe Lecturer Sir T. Spencer Wells, Bart.

NATIONAL DENTAL HOSPITAL AND COLLEGE.—The Annual Distribution of Prizes and Dinner for Past and Present Students will take place at the Holborn Restaurant on Friday, November 21st, when Dr. Benjamin Ward Richardson, F.R.S., will take the chair.

Messrs. Burroughs & Welcome are issuing photographic souvenirs of the British Medical Associations' meeting at Birmingham. One will be sent, upon request, to any of our readers.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

ON THE POSSIBLE DURABILITY OF GLASS INLAYS.

To the Editor of the "British Journal of Dental Science."

SIR,—So much has been promised and to all appearances achieved by the inventors of glass inlays that I approach the subject with no little diffidence.

Whilst freely acknowledging the ingeniousness of Dr. Richter's process and its artistic effect, it is of the utmost importance to know, whether he has overcome the hitherto insurmountable want of durability, since a body capable of fusion in the flame of a spirit lamp, must, I take it, of necessity contain such a large percentage of Venetian glass, borax or frit as to cause its speedy dissolution in the mouth.

Years ago when Mr. Verrier's clever demonstrations in continuous Gum-work aroused interest in this direction, I made enquiries with a view of obtaining a body, the low-fusion point of which would admit of its being used with eighteen carat Gold plates, and eventually obtained through Mr. Pappenheim, of Berlin, a certain "Schiltsky Email" said to be suitable for such work only to find that, as I anticipated, it would not stand in the mouth.

I next consulted Mr. Mountford of Stoke-on-Trent, who told me that after numberless experiments he was unable to produce the desired body, in fact I believe it is admitted on all hands that it is impossible to obtain a low fusion body which shall also be permanent, and my own experiments tend to show that the day is near at hand when the glass inlays will assume a "dull and hollow look."

I trust I may be wrong, and no one will rejoice more than I at such being the case; in the meantime, I should be glad to hear what such veteran Continuous Gum workers as Messrs. Verrier, Gilbert-Walker and Lombardi have to say on this point.

I am, etc.,

HENRY C. BRAUN.

MODELLING COMPOSITION SPLINTS.

To the Editor of "The British Journal of Dental Science."

SIR,—In the Dental Journal of October 1st, I see described by Mr. C. N. Johnson "A Simple Method of Making Splints for Fractured Jaw," as used by Mr. J. B. Wilmott, of Toronto, in two cases. I think it will be interesting to some of your readers, to report that I have very successfully used Godiva, Mod. Comp. in the same way for the last 7 years. I not only used it for a splint round the teeth, but also externally round the jaw. Moulded, when warm, round and under the chin, trimmed up when cold, covered with black silk, lined with lint and tied on with black ribbon, it makes a very comfortable and respectable-looking splint. A patient of mine went hunting on the fifth day with one of these splints on. I have found this treatment very useful in hospital practice.

I am, Yours faithfully,

E. A. BEVERS, M.R.C.S., L.S.A.,

Dental Surgeon to the Radcliffe Infirmary, Oxford.

October 7th, 1890.

ANSWERS TO CORRESPONDENTS.

Correspondents are informed, that we gladly answer any questions : in our power, in these columns, but we cannot do so by post.

A. LUMING.—(a) It means four years of study either as a pupil or at the hospitals ; but, however many years are spent in study, previously to being registered as a dental Student, only one such year will count as part of the above four.

(b) Yes. Can be accomplished in the two years.

(c) Tomes' Dental Anatomy. Churchill's 12/6

(d) Richardson's. Churchill's 16/- or Hunter's, 7/6

ASSISTANT.—You call attention to a most important question but we cannot publish your letter unless freed from personalities. We should be glad of a copy of the report of your case, when it comes on

F. D. PAGE.—There is a good college at the town you mention. Obtain a syllabus from its Dean, join a course of Chemistry and Physics now, and in the summer take practical Chemistry and Materia Medica. The examination is held every three months, beginning in January, at the Examination Hall, Victoria Embankment, London. The Secretary, Mr. F. Hallett, would send you particulars and a syllabus.

British Journal of Dental Science.

No. 547. LONDON, NOV. 1, 1890. VOL. XXXIII.

NOTES ON METHODS OF INTRODUCING GOLD FILLINGS.

By JAMES F. COLYER, L.R.C.P. ; M.R.C.S. ; L.D.S. ;
Demonstrator Dent. Hosp. of London, and Assistant Dental
Surgeon to Charing Cross Hospital.

For successful Gold Filling two steps are necessary ; firstly, careful preparation of the cavity ; and secondly, care in introducing the filling.

The preparation of cavities has been dealt with in a previous paper, and the present one is intended to deal with that of the introduction of the gold. No attempt has been made to give a detailed account, but rather to review the subject, laying stress upon points which are of special importance.

In the hope of assisting in following the text, several diagrams have been introduced, and patterns of a few instruments have also been included.

At the same time, for the sake purely of description, the subject has been divided and considered under four headings, viz. :—

1. The Cohesive Method.
2. The Non-cohesive Method.
3. Cohesive and Non-cohesive combined.
4. Gold in combination with other metals.

i. *The Cohesive Method.*

This method is more usually adopted than any other, and special instruments are employed for introducing and consolidating the gold in this way.

These consist principally of pluggers and mallets, and it may be found useful to briefly discuss their relative merits before passing on to the actual consideration of the introduction of the gold into the cavity.

To consolidate gold, either hand pressure or mallet force is used ; in the former, the force is given to the plugger direct from the hand of the operator, in the latter, by means of a blow struck by either a hand, automatic, engine, pneumatic, or electric mallet.

Hand Mallet.—The hand mallet, the simplest of all mallets, is made of various materials, and in various shapes, the usual form consists of hard wood filled with lead, this giving a dead steady blow.

This mallet is used either by the operator himself, or by an assistant, the blow delivered on the end of the plugger should have a sharp springing stroke. Many operators claim that the results obtained by the use of a hand mallet are better than even these obtained by the electric mallet.

Automatic Mallet.—Automatic mallets act by the action of a special spring, and some of the modern forms have a back action. Of this class of mallet the favourite forms in this country are those manufactured by Ash and Sons, and Buffalo, Dental Manufacturing Co. Of those possessing a back action, Abbot's is the one in general use.

When in use the Automatic mallet should be held like a pen with the end, if possible, resting on a finger of the left hand, thus giving the mallet a point of purchase. The plugger should also be raised a little distance from the surface of the filling, so that each time a blow is delivered it is practically thrust into the gold.

Some place the plugger point on the filling, and then push the mallet, but a great amount of the force of the blow is thus lost.

The Automatic is a fairly serviceable form of mallet, but we should take the precaution to use pluggers whose action will be as far as possible in a direct line with the force of the blow.

Pneumatic Mallets.—In the Pneumatic mallet the necessary force is obtained by pressing with the foot or hand on an air bulb.

The latest improvement in this style of mallet is shown in Fig 1.

The handpiece can also be adapted to convey electric mallet pluggers. This instrument is used by placing the bulb on the floor, exerting the pressure with the sole of the foot. A very slight movement of the foot will be required, the blow being regulated by means of the sliding collar A on the hand-

piece, and by the amount of pressure applied to the bulb. With this mallet several blows can be obtained in quick succession. The instrument is most useful for condensing retaining points, heavy foils, whether cohesive, or non-cohesive, and for chipping down overhanging edges of enamel with a chisel. It is not therefore a mallet to be advised to those who limit themselves to the use of only one.

Engine Mallets.—Of Engine Mallets, Power's, St. George Elliot's and Bonwill's are the forms generally used. The blow is struck by the action of a cam on a pulley driven by the engine, which as it revolves strikes upon the end of the plugger and thus causes a blow.

All these mallets give a varying number of blows dependent upon the speed at which the engine is worked. The disadvantage is that the blow is frequently jerky, but if used with care they are certainly great helps in filling. Power's Mallet is shown in Fig.2.

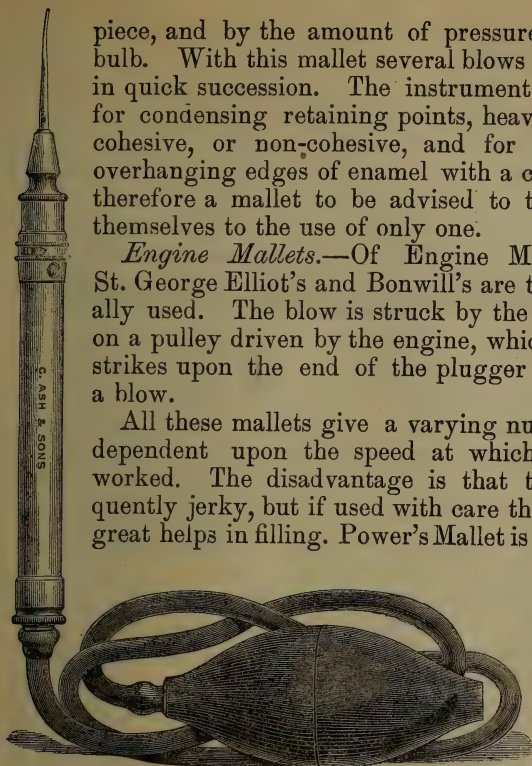


Fig. 1.

Various mechanism are used to control the blow which is consequently to a great extent under the power of the operator. The method of using them is somewhat similar to that of the electric mallet, and will be referred to later on.

Electric Mallet.—Of all mallets the "Electric" is far and away the best instrument as yet invented for condensing gold. The advantages claimed for this instrument are:

- (1) The blow is delivered upon the packing instrument just at the point where its force is greatest.
- (2) The force of the blow can at all times be controlled by the operator.
- (3) It condenses the gold thoroughly and evenly throughout the filling.
- (4) Gold can be impacted against thin frail walls with ease and without fear of fracturing the enamel.

(5) It saves time, and is less fatiguing in its use.

One of the greatest arguments brought against this mallet is that the battery is constantly getting out of order. This disadvantage has now been overcome by the introduction of accumulators which are stored so as to run for varying lengths of time.



Full size.

Fig. 2.

The size in general use runs for about 75 hours before requiring a recharge, which is soon done at a very moderate cost.

These accumulators are a great advance, and give the electric mallet a still greater charm. An illustration of the instrument is shown in Figs. 3 and 4.

To use it, connect the mallet with the battery by passing the pin XX (Fig. 4) attached to the ends of the spring arms of the silk conducting cord A into the holes of the metal plates at YY, then by gentle pressure with the finger on the slide C, it slips forward and closes the current. The iron cores E, then become converted into electro magnets and attract the armature D, which strikes the plunger F, the blow being imparted to the plugging instrument H, which is in turn thrust forward, and then returned to position by the springs Q.

The interrupter I, is also struck at the same time and the circuit thus broken at K.

Directly the current is broken the iron cores E, cease to be electro magnets, so that the armature becomes released, and is forced away by the spring L. This latter action, by releasing the armature D naturally relieves the pressure on the interrupter I, which is carried back into position by the recoil spring N, which surrounds it. Directly it is in position again, the current is again closed, the coils E, again assume the position of electro magnets, the armature is again attracted, &c., &c. The instrument being kept in operation as long as pressure is continued upon the slide C.

The length of stroke of the armature or mallet D, is regulated, and the force of the blow to a certain extent

Fig. 3.

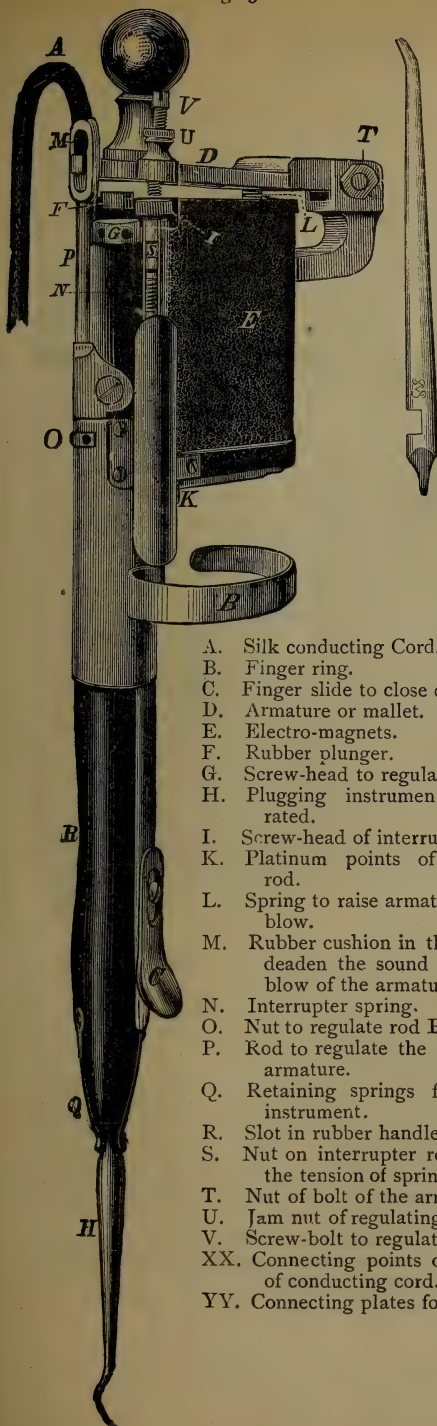
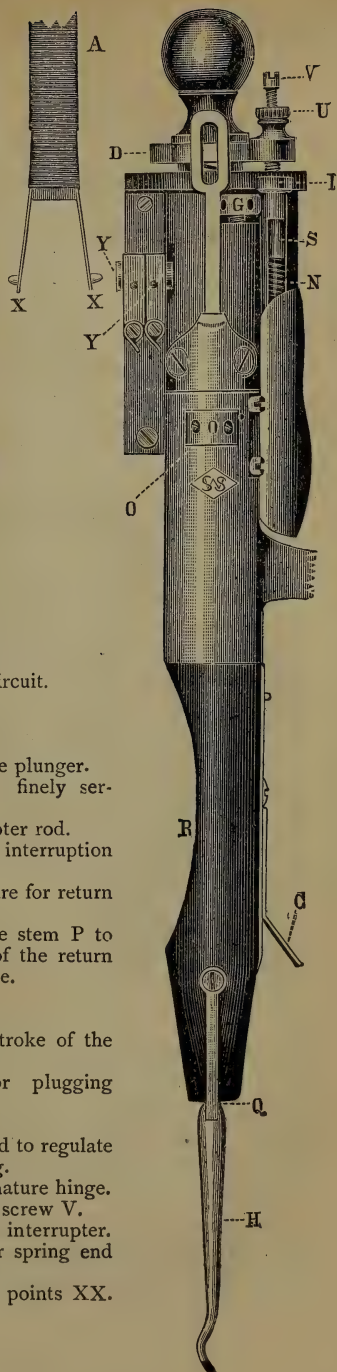


Fig. 4.



- A. Silk conducting Cord.
- B. Finger ring.
- C. Finger slide to close circuit.
- D. Armature or mallet.
- E. Electro-magnets.
- F. Rubber plunger.
- G. Screw-head to regulate plunger.
- H. Plugging instrument, finely serrated.
- I. Screw-head of interrupter rod.
- K. Platinum points of interruption rod.
- L. Spring to raise armature for return blow.
- M. Rubber cushion in the stem P to deaden the sound of the return blow of the armature.
- N. Interrupter spring.
- O. Nut to regulate rod P.
- P. Rod to regulate the stroke of the armature.
- Q. Retaining springs for plugging instrument.
- R. Slot in rubber handle.
- S. Nut on interrupter rod to regulate the tension of spring.
- T. Nut of bolt of the armature hinge.
- U. Jam nut of regulating screw V.
- V. Screw-bolt to regulate interrupter.
- XX. Connecting points or spring end of conducting cord.
- YY. Connecting plates for points XX.

controlled by the nut O, acting upon the rod P, to lessen or shorten the stroke.

The plugging instrument H, which passes through the rubber hand-piece, is controlled by the thumb, through the opening R.

The instrument can be adjusted as follows: Press the instrument H, against the plunger F, regulating F, by the screw nut G, so that when the armature is pressed against the plunger, there is just room enough to pass a piece of thin writing paper between it and the magnets, while at the same time the end of the adjusting screw V, should just perceptibly touch the interrupter head I. The screw when adjusted, is held in position by the jam nut U.

If the screw V, does not strike the interrupter I, as soon as the blow is given to the plunger, the armature will be held down by the magnets, as the current will not be broken. On the other hand, if the adjusting screw V, strikes the interrupter rod I too soon, the circuit is broken before the blow is delivered on the plunger F.

When more or less rapid blows are required, the rod P, should be shortened or lengthened by the nut O.

Should the mallet fail to work, and all attention to above have been paid, the operator should then turn his attention to

(a) *The Spiral Spring* surrounding the interrupter, for should this not be properly working, the current cannot be closed.

(b) To the *Platinum points at K*, or should any substance have been caught between them, the circuit will be naturally destroyed, hence it is a good plan to pass a knife-blade between them occasionally.

(c) *Connection cord*, the ends attached to the battery may have become loose, or oxidized—or the conducting cord may have broken.

(d) Failing the above attention must be bestowed on the battery, which may have been exhausted.

It is needless to say that everyone who uses the mallet should thoroughly understand its mechanism. Cohesive gold should always be used with it.*

In commencing the filling one or two pieces of foil should be placed in the retaining point of the cavity with the instru-

* The following description of the method of using the Electric Mallet is condensed from Marshall Webb's Operative Dentistry.

ment by hand, as each piece of gold is passed over the flame of alcohol, and introduced into the cavity (either by an assistant with light pointed foil carriers, or by the operator himself with the packing instrument), and simply attached to the starting point or that already there, the electro-magnetic mallet should be set in operation, and the finely serrated point of the packing instrument touched upon or placed (not pressed) against the gold in a manner similar to that of making dots on paper with a pencil. Light, medium, or hard blows can be made without changing the adjustment of the

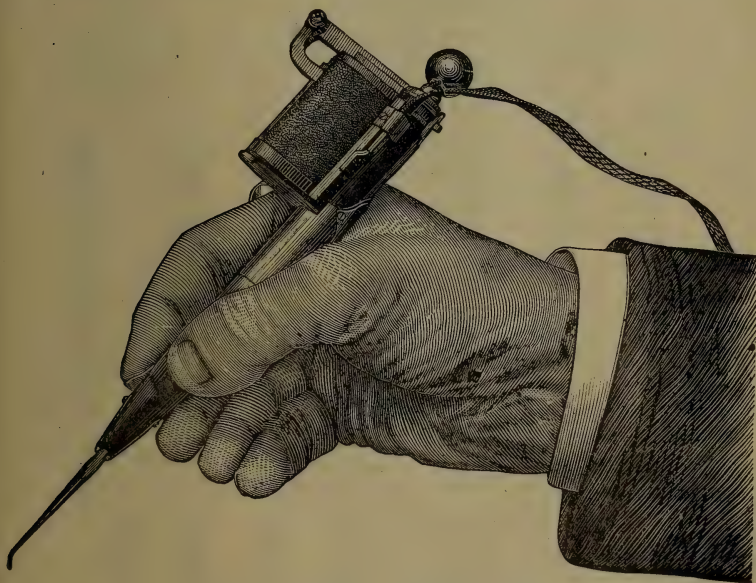


Fig. 5.—Method of holding the mallet.

instrument, as full or heavy lines are made on paper with a pen. When the electro-magnetic mallet is operated and guided as indicated above, gold can be carried against and over the margins (even frail edges), of enamel without fracturing them, and without the packing instrument passing off and puncturing the rubber dam and wounding tissue. Almost the same blow is required throughout each and every operation, because the gold should be solid and uniform in density, hence the action of the battery must always be about

the same in intensity and constancy, and the pieces of gold for a given operation ought to be nearly the same size; all foil should be cohesive, by passing through the flame.

The successive and rapid recurrence of the blows, enables an operator, with careful and intelligent guidance of the instrument to go over the whole surface of the foil much better, and make the gold more solid and uniform in density with greater ease and rapidity than by any other known method.

This is true of the work of the electro magnetic Mallet, because to expel the air from between the particles of foil and place them in absolute contact in every given piece or body of gold, or, in other words to place all the cohesive particles within the "sphere of influence" of one another, a

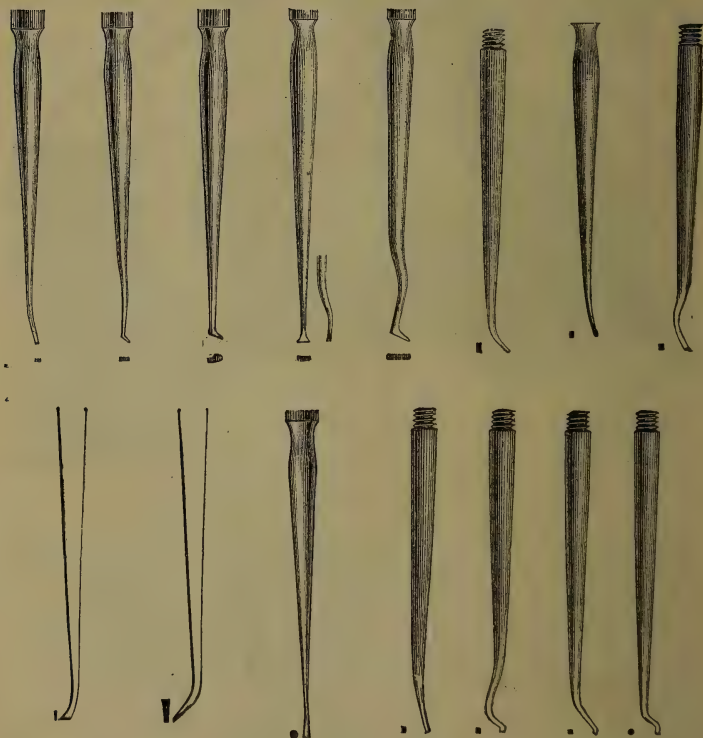


Fig. 6.

certain number of blows of given force are necessary ; and to thus go over the whole of each piece being impacted by any other known method would require the expenditure of more time and greater effort. That gold may be made compact it is not so desirable that a heavy blow be struck, as it is necessary that rapid, regular and moderately heavy blows be skilfully given to each piece of foil. By no other method can this be done so well and so perfectly as with the electro-magnetic mallet.

With regard to pluggers, the patterns one finds most useful for the Electric Mallet are shown in Fig. 6.

The same set can also be used with either the pneumatic or the Bonwill Engine mallets.

For use with automatic mallets, pluggers with rather a coarser cut may be advantageously used.

For hand pressure the instruments known as Mr. Woodhouse's set, will probably be found the most useful.

(To be continued.)

THE EARLY DIAGNOSIS OF SURGICAL AFFECTIONS OF THE MOUTH.*

By EDMUND W. ROUGHTON, B.S., M.D. (London), F.R.C.S.
University Scholar and Gold Medallist in Surgery.
Hon. Vis. Surgeon to the National Dental Hospital.
Senior Demonstrator of Anatomy at St. Mary's Hospital.

Gentlemen :—When I was asked to read a paper before you, I had at first some difficulty in choosing a subject. I thought over the various affections of the teeth, and felt convinced that the only result of trying to teach you anything about your specialty, would be to show you how ignorant the general surgeon is of matters relating to the teeth. It seemed to me, therefore, that I could be most useful to you by drawing your attention to some of the commoner affections of the parts near the teeth, for although you may not often be called upon to treat them, yet in attending to the teeth you may often see the early stage of serious disease in the mouth,

* Read before the Students Society, National Dental Hospital, London.

and by recognising it promptly be of the greatest service to your patient. Indeed in this respect a very considerable responsibility devolves upon the dental surgeon, probably more so than in any other part of his work, for in the treatment of the teeth it is very seldom that the dental surgeon can be said to save his patient's life, although he does an enormous amount to make it happy, but by recognising early cases of malignant disease of the mouth, before they are a cause of much trouble and therefore of complaint, he may by advising suitable and adequate treatment justly claim to have diverted his patient's steps from a road leading to a certain and miserable death.

Let me first draw your attention to cancer of the tongue. This disease, like murder and many other objectionable things, may begin in a very trifling deviation from the normal, so slight indeed as only too frequently to escape observation. The very triviality of the earliest stage of cancer of the tongue affords a double reason for your being familiar with it, for firstly it will rarely be a cause of complaint, and secondly, when recognised, treatment will be efficacious, instead of futile, as it is in advanced cases. The name "precancerous" has been applied to these early departures from the normal state, conditions which, in themselves, are not cancer, but which if left alone will most assuredly become cancer before very long.

Before proceeding to describe in detail the various precancerous conditions, I wish to impress upon you the fact that cancer of the tongue is so rare in young people, say under 25 or 30, that you need never regard any condition you may find in them as precancerous, but in people of more advanced years, say over 40, remember that any sore place on the tongue if continually irritated is extremely likely to become cancerous.

Although any chronic sore on the tongue of an elderly person may become cancerous, yet there are certain conditions by which cancer, so to speak, prefers to make its *entrée*. One of the commonest is an abrasion, or small ulcer at the side of the tongue, produced by the rubbing of a ragged tooth or a badly fitting plate, or preceded by a tiny blister, which has burst and left a raw surface, or by a little fissure. Such an abrasion is, of course, not a cancer, but should be regarded as an unwelcome guest, and its room preferred to its presence, even though it cause no pain, no discharge, nor inconvenience of any sort. If it remain untreated, and be constantly chafed, say by a rough tooth, it will very slowly, but surely, increase

in size ; its progress may be so slow, that after 3 or 4 months it may be difficult to say whether it really has got larger.

But sooner or later it will become indurated, so that when the finger is lightly passed over it, it will give the sensation of an actual little lump in the tongue. The surface of the ulcer will gradually become foul and sloughy-looking, being devoid of granulations and exuding a thin discharge with a very offensive odour. When the sore has reached this stage it is undoubtedly cancerous, although we cannot say exactly when the pre-cancerous stage ended and the cancerous stage began. I think, however, that you will be safe in regarding any chronic sore on the tongue which presents well marked induration as cancerous.

The next pre-cancerous condition, I will draw your attention to is leukoplakia, a condition which as you know, is most frequently produced by excessive smoking. It is a very easy disease to recognize, presenting as it does a silvery white coating over more or less of the front part of the tongue ; it is very difficult, if not impossible to cure, and very chronic in its course, often remaining in the same condition for years. But sometimes, from the irritation of the end of a tobacco pipe, or from smoking very hot tobacco or other causes, the patch of leukoplakia becomes fissured and ulcerated in one or more places, these ulcers become indurated and soon undoubtedly cancerous. Sometimes in the middle of a patch of leukoplakia a small warty growth makes its appearance, standing out like a small bean on the surface of the tongue.

Such a growth should be removed without delay, for at any time it may become indurated and ulcerated, and then it is certainly cancerous.

A less frequent beginning of cancer consists in the formation of a small lump in the deeper parts of the mucous membrane of the tongue. The lump gradually enlarges and eventually breaks upon the surface, leaving a foul excavated ulcer, or a fungating mass.

When once cancer of the tongue is fully developed, it presents itself in such pronounced characters, that its recognition is extremely easy, but unfortunately too often useless, as then it will almost certainly have gone beyond the reach of surgical treatment, leaving the sufferer nothing to look forward to but death from the combined effects of starvation, hæmorrhage and blood poisoning. It is from this terrible end that I hope many of you will be able to rescue your patients by the recog-

nition of the early stages of cancer which I have described to you.

Next, as to syphilis of the mouth: this is an important disease for the dental surgeon to be familiar with, for two reasons, firstly, because syphilis requires early and adequate treatment, but secondly, and chiefly, because it is possible for the dental surgeon to convey syphilis from one patient to another by means of his instruments. I do not know whether dental surgeons, as a rule, sufficiently appreciate this important fact. It is well known that all primary and secondary syphilitic lesions are certainly contagious, and that during their persistence the blood also is virulent. What then could be more risky than for a dentist to extract the tooth of a patient with secondary syphilis, and then, with the same instrument, imperfectly cleaned, proceed to wound the gum of a healthy person? I do not remember ever having actually seen syphilis conveyed in this way, but that it is quite possible, I think you will infer from the following account of circumcision chancres taken from Mr. Hutchinson's book on Syphilis:—

“It has been assumed that when syphilis is conveyed to Jewish infants in the operation of circumcision, it is usually due to the practice of the operator putting the penis into his mouth. It fell to my lot, not long ago, to have to investigate a group of cases to which this explanation would not apply. The priest who had done the operation assured us that he never sucked the penis, and he was besides a man of good age, and wholly free from syphilis. The facts were briefly these:—During a period of about 6 weeks this man had been giving syphilis to his patients; not to all of them, but to one now and then. We examined, to begin with, the operator himself. He had no sore on his hands, nor had he the slightest indication of ever having suffered from syphilis. His instruments, a knife and thin metal shield, were clean (as might be expected when shown to us), and he asserted that he invariably washed them after each operation. A clue was given us on our being told that it was the custom of the priest to take the foreskin home with him, in order that it might be ceremoniously burnt. Before hearing this, I had got a strong impression that the vehicle of contagion must have been the lint used for dressing. On our asking where he put the foreskin, he told us that he always placed it in his instrument box, under the lint, adding ‘See, here, this is the place; you can see the stains.’ There sure enough on the silk lining of

his box were abundant stains of blood, and apparently of pus. Here, prepuce after prepuce had been placed, the fresh blood of one remoistening the dried up fluids left by its predecessors, and directly on these were laid the strips of lint which were to be used as dressings. The discovery seemed to fit precisely with the facts. No doubt the beginning had been the circumcision of a syphilitic infant."

Here then we have clear proof of an indirect conveyance of contagion from one patient to another, and an *a fortiori* proof of the possibility of conveying contagion directly from the mouth of one patient to that of another by means of instruments. I do not know what precautions dentists as a rule take to avoid such a mishap, but I would very strongly advise you to adopt some very efficient means of cleansing every instrument every time you take it from a patient's mouth.

I will now give you a short account of the chief syphilitic affections of the mouth.

(a) Primary syphilitic sores have been frequently seen upon the lips, sometimes on the tongue and occasionally even on the tonsil. These so-called erratic chancres may assume the most peculiar and variable appearances, and do not therefore admit of any terse description. It is a good rule to suspect, that any sore of peculiar appearance and which presents great difficulties in diagnosis, may be a primary chancre. One will then of course look for confirmation in the shape of enlarged hard glands in the neighbourhood and the manifestations of secondary syphilis elsewhere.

(b) Secondary syphilitic affections of the mouth and throat are extremely common. On looking down the throat it will be seen that the fauces are slightly redder than natural, and that on the tonsils (usually both sides), there are peculiar kidney shaped ulcers. The symptoms accompanying this condition vary greatly in severity, indeed they are sometimes so slight that they are unnoticed by the patient, and the sore throat is only found when looked for by the doctor. There are several other varieties of syphilitic sore throat, but this one is the most important for you to know about, for it sometimes happens that a patient contracts syphilis, and does not find it out for some time, thus delaying the necessary treatment. Together with the affection of the throat, it is very common to find superficial ulcers on the mucous membrane of the lips, especially near the corners of the mouth, and on the inside of the cheeks, near the last molar tooth. These ulcers are

quite superficial, looking like mere abrasions, and are surrounded by a congested area, and covered with a sticky exudation. They are due to the breaking down of mucous patches. Similar ulcers are common on the tip and edges of the tongue, for in this situation mucous tubercles are very likely to break down from injury caused by the teeth. It is usually the central part of the tubercle that breaks down, leaving an irregular ulcerated crack or surface, surrounded by a smooth whitish border, outside which again, is a halo of congestion. If these ulcers be subjected to continual irritation by rough teeth, smoking, irritating food, drink or injudicious treatment, they may enlarge considerably, especially if the patient be in bad health.

These appearances, manifested in the mouth and throat, are practically sufficient to make the diagnosis of syphilis, but if confirmation be required, it is nearly always to hand, in the shape of a coppery rash, to say nothing of the primary lesion on the genitals and the hard glands in the groin.

(c) Tertiary syphilis may affect the tongue in various ways. Gummata are not uncommon and they may occur in any part, but are most common on the dorsum of the tongue near the middle line. They may be either superficial or deep, so far as position is concerned. When superficial, they occur in the shape of small nodules situated in the mucous membrane and submucous tissue. They are about the size of a small shot or pea, are hard to the touch and usually somewhat ill defined in contour. The mucous membrane over them may be natural, or if they are very superficial, is more often smooth, owing to the papillæ getting rubbed off. So long as they are not irritated they are painless and apt to escape notice; but when irritated they inflame and break down, leaving small superficial ulcers.

When numerous, these ulcers may cover a large portion of the surface of the tongue, and make it appear fissured and furrowed. They are prone to be very chronic, especially when inadequately treated. When they heal, they pucker the surface of the tongue and cause great disfigurement. The second variety of gumma of the tongue is usually much larger, and may form a lump the size of a walnut, situated deeply in the tongue. At first it is painless, somewhat ill-defined, and covered with healthy mucous membrane; but after a longer or shorter time it softens, the mucous membrane over it gives way, a slough separates and a deep ulcer with a foul sloughy surface remains. I cannot leave the tongue, on this occasion,

without saying a few words about dental ulcers. They are seen most frequently upon the tip or borders of the tongue, and vary a good deal in appearance. The edges of the sore are usually sharply cut and irregular, the surface covered with a thin slough, the surrounding area red and angry looking, and the substance of the tongue beneath and around the ulcer, swollen, sodden, and somewhat indurated. In chronic cases the induration may be so great as to render the diagnosis from early cancer very difficult, indeed, as I have already pointed out, cancer may, so to speak, become engrafted upon such a case. Once more let me impress upon you the importance of not letting a chronic ulcer of the tongue drift on.

I now pass on to another class of cases where the early diagnosis of malignant disease devolves upon the dentist. I refer to epithelioma, beginning in the socket of a tooth. In these cases the patient, as a rule, will not complain that he suffers from a tumour or growth of any kind, but will seek relief on account of toothache or looseness of the teeth; consequently, there is a great risk that a careless or ignorant dentist may overlook the real cause of the trouble, and content himself with pulling out a tooth or two. On the other hand, the smart, well-educated dentist will prove himself equal to the occasion, and insist upon his patient submitting to prompt and efficient surgical treatment, thus doing him an immense service.

The following case, reported by Mr. Tomes in the *Odontological Transactions*, is very instructive, and illustrates my remarks very forcibly.

The patient had been under Mr. Tomes's care on account of separation of the palatine from the labial roots of the 2nd upper molar. The condition was remedied by appropriate dental treatment, and the patient remained in comfort for about 18 months. At the end of that time, however, the tooth became loose and its neck was seen surrounded by ugly looking granulations. After the tooth was extracted, the socket was found to be filled with an epitheliomatous mass. A delay of 2 or 3 months was occasioned, partly by attempts to destroy the growth with caustic, and partly by the patient's indecision to submit to an operation, with the result that the growth extended, and involved the tuberosity of the superior maxilla and a small portion of the cheek; consequently, when the disease was attacked surgically it was found necessary to perform a somewhat extensive operation, which left a hole in the palate, big enough to put a walnut into. The

patient, however, made a good recovery, and the deficiency in his mouth was supplied by a vulcanite plate. It must have been a source of regret to those concerned in this case, that adequate surgical means were not employed as soon as the nature of the disease was discovered.

Sometimes the first suspicion of a malignant tumour of the antrum is aroused by a portion of the growth coming away on the fang of a tooth, extracted for toothache. Here a careful microscopic examination of the portion of growth will reveal the true nature of the case. I would therefore urge that every suspicious looking tissue found attached to the fang of a tooth after extraction, should be most carefully examined, and the case closely watched, lest it should prove to be one of malignant disease.

In conclusion, Gentlemen, I must acknowledge, that I have told you a good many things to-night, which you probably knew perfectly well before. I do not regret having done so, for just as there are two kinds of energy, potential (which might do something, but does nothing) and actual (which really does something), so one may say that there are two kinds of knowledge one (which you may call potential) a variety of knowledge which we undoubtedly possess, but do not make use of, because when it would be of service to us, we have forgotten that we possess it; and the second actual knowledge, which we not only possess, but which we really make use of. Potential knowledge is of no use in the diagnosis of the early stage of malignant disease, for as a rule there is nothing striking enough about the case to bring out our knowledge from the remote recess in our memories where it is stored. What we require for every-day work is actual knowledge, a force which is always on the alert, and always ready equipped for active service. If to-night I have imparted fresh information to some of you, and for the rest of you converted potential knowledge into actual knowledge I shall feel that my endeavours have not been wasted.

DRY COPPER AMALGAM.

By DR. HENRY BARNES, Cleveland, O.

MUCH has been written of copper amalgam as a filling material, but it is not giving the satisfaction claimed for it on its

first introduction to this country ; we believe this is owing to an excess of mercury. Some writers claim for it ease of manipulation, and we can readily understand how they use it, full to overflowing with mercury. No wonder 'tis easy—others “add mercury if too dry.”

We have to a certain extent followed the advice of those, who were supposed to know, with very discouraging results. From experiments covering a period of about one year, we are clearly of the opinion that mercury should never be added to the amalgam to insure its plasticity. To make copper amalgam : Precipitate the copper, using either zinc or iron, and proceed in the usual way, heating, triturating and expressing the mercury (always use the vice) until the amalgam presents a copper colour, when it will be found difficult to make it ball or mix, then place in a bottle for use. After a few hours the pellets will be found of a dirty copper colour.

To mix for filling : Heat a quantity in an iron spoon until the globules of mercury appear all over the surface, and crush to powder while yet in the spoon, again heating until the mass presents a dark appearance, when it is placed in the mortar and triturated for a few moments; now add a little water which will facilitate amalgamation ; again place in the spoon and heating until the water is entirely evaporated, when it is transferred to the chamois skin and twisted into a ball ; now place in the vice, and while tightening, twist the chamoise at the same time, which will express the mercury and leave an amalgam rather hard and not easy to manipulate. Now if broken up into small pieces and placed in the cavity, piece by piece, it can be worked with a burnisher (of proper size and shape for the cavity) either by hand or better with the engine when a hard polished surface having a copper colour will be the result. This will become very black, but will not discolour the tooth or cup. Any of the copper amalgams now sold will produce the same results, if only the mercury with which they are all overloaded is thoroughly expressed. Do not be afraid of burning the amalgam, as overheating seems to be good for it. The object of this paper is not to make the filling of teeth with amalgam easy, but to overcome some of its defects, and thus get the best results out of it for our patients.

British Journal of Dental Science.

LONDON, NOVEMBER 1st, 1890.

CLINICAL TEACHING.

THE question whether or no it is desirable that the staff of our Schools should invite men, outside their own number, to give Clinical Lectures and Demonstrations to the students, is one about which, as, indeed, about most other questions, there may be two opinions. But the advantages such a plan presents has been recently fully demonstrated by the lecture given by Dr. Miller of Berlin, (illustrated by Lantern Projections by Mr. Howard Mummary) as one of the course on Operative Dental Surgery, now being held at the National Dental Hospital School. For ourselves, we must confess that we are very much in favour of this precedent being followed, not only at the above School but at all others. We do not, of course, mean that each and every man who has some hobby, good, bad or indifferent, which he wishes to ride, should be invited to come and bore the students, but there are so many good men and tried, of acknowledged worth and talent, who have something good to show, something worth having to teach, that we ask: Why are these not invited to lecture and demonstrate on their special points to the students in our schools? We suppose no one would be bold enough to claim that the staff of any school is absolutely perfect; or even that is as perfect as it might be were the fates more propitious in this imperfect world of ours. We do not wish at all to deprecate the staff, of any Dental Hospital, indeed, we gladly admit that they are exceptionally able bodies of men. But this is not the point. The question is, are there any men outside, who could with advantage to the students give occasional in-

struction in schools? We believe the answer is : Yes, there are. Consider the circumstances under which the staff are elected ; there is a vacancy, candidates apply and he, who is considered the best, is elected. But there are others equally able who by some chance circumstance are debarred from competing. They may reside in a provincial town. They may have engagements which prevent their devoting the time needed for the post of demonstrator and such like, posts which are stepping-stones (and rightly so) to a position on the staff. Now, of course it is all a matter of *quid pro quo*, or to put it in a more homely way, a man can't have his pudding and eat it too ; he can't reap the harvest of private practice and yet earn a hospital renown. This, however, would be all very well if the whole thing were simply a personal question between A and B. But it isn't. We really don't care a rap about A and B. They may become famous and glory therein, or they may become the reverse and console themselves with the soliloquy "*Vanitas vanitatum, omnia vanitas.*" Either way, it matters very little to the profession at large. But what does matter is, that students should have every facility offered them of seeing all there is to see and hearing all there is to hear. We can see no practical difficulty in the way of the attainment of this object. Invitations to give lectures or demonstrations would of course have to be sent out by the school authorities, but these could, and no doubt would, be issued in a catholic spirit. Two advantages from such a course seem to us to stand out prominently.

First. The interest of the students in their work would be stimulated.

Second. The Hospital would gain the sympathy and the help of all the members of the Profession.

Apparently there is one righteous man in the land. During the discussion at the conclusion of Dr. Miller's lecture, Dr. Cunningham expressed himself somewhat warmly as to the absence of any Dental Science Laboratory. We have so often hammered this question, though it almost seems like

whipping a dead horse. We would, however, venture to suggest to Dr. Cunningham, that he should bring forward some definite proposals either at the School of whose Staff he is a member or at some of our Societies.

Under the heading "Princely Incomes," a New York paper gives figures as to the earnings of men practising different professions in that city. Lawyers head the list, several of whom are mentioned as having incomes of 200,000 dollars. Only one physician, Dr. Hammond, reaches this figure, whilst the surgeon, Lewis Sayre, falls short by 50,000 dollars. One lady, Dr. Mary Jacoby, is said to make 60,000 dollars a year. Dentists don't seem to approach these big figures. A Dr. Parr is mentioned as earning a hundred dollars a day, and another dentist is reported as saying that he once earned 500 dollars in one day; this, however, was for a patient, with more money sense, who wanted diamonds in her front teeth. This dentist seems to have expressed disapproval of this absurd disfigurement, but having an elastic conscience he humoured his patient and pocketed the fee.

From some details published in the report of the Educational Section of the American Dental Association, we gather that there is free trade in Diplomas in the States, even if there is protection in other directions. There are apparently thirty-three colleges, and nine hundred and sixty-three students were graduated during the past year; this is an increase of one hundred and sixty-seven on the previous year. Now, of course, if this were a normal growth, we could hardly grumble, though we might well be surprised, but it is not. On all hands it is admitted that many colleges are but bogus affairs, and which, through some false idea as to the liberty of the subject, are yet allowed to spring up like mushrooms without let or hindrance. Yet surely those young men have a right to complain, who, having spent time (however limited it may be) and money, and having been granted the high-sounding degree, Doctor of Dental Surgery, find that it carries with it neither right to

practise, without an additional examination conducted by a state board, nor a recognition of competency. It is almost as grotesque as a king without a kingdom.

THE following letter, which is published in the "Archives" must certainly be unique. The writer is a non-qualified quack in the States, who is being proceeded against :—

——.Mo. Apr. 9th 1890

JAS. A. PRICE

Dear Sir yours at, but not ountill a short time sence. you tell the fellow that has filed a com Plaint a gainst me to goui off, soap his head. and git the skirff. of the Back of his. neck. or he will not be so small in all his oundertaking I am a Law biden man I dont know what he is. nor dont cear with out giving you short ancer I meet oup on the levell & Part oup on the squair with all man kind I was glad you Dropped me a note Yours truly uon till Death if enny thing elce is said let me hear from you This the said. ———D.D.S.

The D.D.S. may mean anything or nothing, but he has no degree. Mr. Jas. A. Price is one of the "Law Committee."

THE study of chemistry is going-a-head at the University of Cambridge. There is a new University laboratory in Pembroke Street, which has recently been built at a cost of over £35,000. Caius College is also building a new laboratory, which will accommodate 50 students at once.

IT seems we were wrong in stating that Dr. Matthew Duncan's death created a vacancy on the Medical Council. He resigned his seat a couple of years ago. We are indebted to Mr. S. J. Hutchinson for drawing our attention to this. At the same time our remarks as to the need of a Dental on the Council are equally true, though the chance of remedy may be delayed. Indeed, it will allow those who have influence, a longer time to use it. We draw attention to Mr. Morton Smale's letter, on this subject, to the "*British Medical*," it will be found on another page.

Abstracts of British & Foreign Journals.

NEW METHOD OF VULCANIZING RUBBER PLATES.

By GEORGE B. SNOW, D.D.S.

DURING the process of hardening, a mass of rubber compound experiences an actual decrease in bulk, its specific gravity being considerably increased.

“Shrinkage” in this article designates the alteration in bulk and specific gravity which rubber undergoes in its transformation into vulcanite.

“Expansion” and “contraction” denote the changes induced in the mass by changes in the temperature.

“Mechanical pressure” denotes the pressure brought to bear upon the contents of the mould by the act of closing the flask.

The pressure which the rubber exerts upon the mould, as it expands when heated, will be called “expansive pressure” in contradistinction to “steam pressure,” which is brought to bear upon the flask and its contents by the evaporation of water contained in the vulcanizer during the vulcanizing process.

Shrinkage is greater in amount, in proportion to the purity of the rubber compound. Its effects are more apparent with black than coloured rubbers ; which contain a large amount of foreign matter.

The effects of shrinkage may be seen, in the process of repairing rubber plates, when a block of teeth is removed therefrom. If there is any considerable amount of rubber under the teeth, a space will be found between the two into which a thin instrument can be easily passed. This space is usually a receptacle for the debris of food, which, being there retained, decomposes and gives off disgusting odours.

This condition of things was known and recognized in gold plates, when the teeth were ground and fitted to the plate, and afterward backed and soldered thereto. No one could make a joint under such circumstances so close as to exclude organic matter. And one reason why rubber came so rapidly into

use, was the fact that it seemed to promise immunity from this defect.

The assertion is here made that the defects mentioned above are the rule, and not the exception; and although the statement will, no doubt, be denied, it is the fact that their existence can be demonstrated in the majority of rubber plates.

There is also a question whether shrinkage is not to blame for the difficulty sometimes experienced in fitting rubber plates to mouths requiring a considerable amount of so-called "restoration," involving the use of a large amount of rubber over the alveolar ridge. The best fits and most satisfactory plates are those in which it is possible to set the teeth close to the alveolar ridge, leaving but little rubber under them; while annoyance is usually experienced when the use of a large quantity of rubber is required at this point.

A few experiments recently made have thrown some light upon the subject, and it is now believed that a method can be pointed out by which the defects and annoyances heretofore alluded to can be wholly overcome, and that the perfect vulcanization of a dental plate can be made an easy matter.

To determine the time at which shrinkage occurs, a number of samples of rubber were vulcanized at times varying from ten to ninety minutes, at the same temperature, 320° ; the Coolidge Regulator being used to insure uniformity in temperature.

The specific gravity of the specimen of unvulcanized black rubber was 1.13398. The same rubber vulcanized for forty minutes at 320° and imperfectly cured, had a specific gravity of 1.19082. At the end of one hour, when it was thoroughly hard, it was 1.19284. It will be observed that the increase of specific gravity for the first forty minutes was $1.19082 - 1.13398 = .05684$, while for the next twenty minutes it was only .00202: showing that the greater part of the shrinkage took place in advance of the hardening process, and was nearly completed during the first forty minutes. The relative bulk of the same mass of rubber, soft and vulcanized, would therefore be 1 to .9506.

It has been found experimentally that the expansion of vulcanizable gum from 212° to 320° amounts to about as much as its shrinkage in vulcanizing.

The expansion of vulcanite (black) is set down as .0000428 of its length for each degree (Fahr.) between 52° and 77° .

Between 77° and 95° it is .0000468 for each degree. These numbers give the average between the temperatures named. It will be observed that the rate of expansion increases with the temperature, as is usual with solids. Allowing that the rate of increase remains constant, its linear contraction in cooling from 320° to 80° will be as 1 to .99369. Its cubical contraction, or decrease in bulk, would be as 1 to .9812; much less than its shrinkage. By the conjoined action of shrinkage and contraction, a mass of rubber, being vulcanized, would be reduced in bulk as 1 to .9388.

In the ordinary method of moulding a plate in a bolted flask, gateways are cut, to provide for the escape of surplus rubber, and the mould is packed with a sufficient quantity of gum to fill it. The two parts of the flask, being bolted together, are heated to soften the rubber, and the flask is closed; any surplus rubber oozing from the mould into the gateways. The flask is then put into the vulcanizer, and heated to the vulcanizing point. While the heat rises, the rubber continues to expand; and it is constantly oozing from the mould into the gateways. If it were cooled, even before it reached the vulcanizing point, there would certainly be a vacuity somewhere in the mould from contraction.

The moment the vulcanizing point is reached, and the temperature becomes stationary, shrinkage begins; the expansive pressure is relieved, and in a few moments the mass of rubber becomes too small to fill the mould. As it adheres to the surface of the plaster, it is drawn away from the teeth and pins, to which it has less adhesion; as the rubber will not pass from the narrow gateways back into the mould to fill the vacuity, except possibly to a very limited extent.

If radiating gateways are not cut extending into the mould but merely a circumferential chamber of escape be employed, from which the rubber in the mould is entirely cut off as soon as the flask is closed, the use of bolts to hold the parts of the flask together will be found to be very dangerous. The rubber, in its expansion as it is heated to the vulcanizing point, will exert a force which the plaster mould cannot resist, and the consequences will be the injection of rubber into the joints and possibly the cracking of the blocks and their displacement.

If the mould prepared in this manner, is held in a spring clamp while vulcanizing, the expansion of its contents will cause the spring to yield, allowing the flask to open a trifle;

and a certain quantity of the rubber will escape into the chamber surrounding the mould. The escape will not be free, and the natural elasticity of the rubber will allow of the retention of some of it which would escape if the radial passages were present. The increased pressure upon the rubber will allow of the retention of some of it which would escape if the radial passages were present. The increased pressure upon the rubber will be likely to cause its injection into the joints between the blocks, and if any of it escapes there will be a vacuity from shrinkage ; it is quite possible, however, that it will be less than in the former case.

To produce perfect results, the mould must contain just that quantity which will fill it when vulcanized, at a temperature so low that it will have no tendency to "flow," or change its shape permanently.

After the rubber is pressed into the desired shape, or in other words, after the mould is packed, it must be relieved of any constraint which will resist the expansion of its contents by heat and cause them to escape.

After the shrinkage incident to vulcanizing has taken place the mould must be pressed, to force the rubber against the teeth and pins ; and this pressure must be continued until the plate is nearly or quite cold.

To test this theory, a set of teeth were mounted, setting them at a considerable distance from the model. They were flaked, the usual gateways were cut, radiating from the mould, with an encircling channel. The mould was then packed with black rubber, substantially in the manner above suggested. The flask was left free to open as the rubber expanded by heat, and pressure was applied to close it, nearly at the conclusion of the vulcanizing process. Another set, a counterpart of it, was mounted, flaked in a bolted flask, packed with the same kind of rubber, and vulcanized in the ordinary way ; the flask being firmly bolted during the process. Both sets were allowed to remain in the flasks until cold. When they were vulcanized and finished, one set could not be distinguished from the other. They were both perfect so far as could be judged by outward indications.

A bicuspid block was then broken out of each set. In the first set, the pins which held the block were found to be firmly held by the rubber, which also fitted closely against the under sides of the teeth, so that the joint was apparently perfect. In the other, the pins were loose ; and there was a consider-

able vacuity under the remaining blocks, nearly a thirty-second of an inch in depth.

The sound given forth by these plates when dropped upon the table was distinctive and characteristic. The first gave a ringing sound as though it were but one piece ; the other rattled as if cracked. They could be easily distinguished from each other in this way with the eyes shut.

This experiment was performed with the Crane vulcanizer, which has a screw-press attached to it, with a spring interposed between the screw and the presser-foot which bears upon the flask. This mechanism gives perfect command of the amount of pressure applied to the flask and the time of applying it. It therefore fills all the requirements of the method of vulcanizing suggested above ; giving a gradual and equable pressure, which can be applied at any time during the vulcanizing process, as desired. The amount of time and attention required is but a trifle more than is requisite with the old method.

A number of plates have since been moulded by this method, for use. Their adaptation to the mouth is good, and they have proved satisfactory in every way.

The same results can be attained in an ordinary vulcanizer, but it will be necessary to heat the flask twice. It will also be advisable to use some kind of a spring clamp, possessing power enough to make the rubber flow and re-adopt itself when re-heated. The *modus operandi* will be as follows : Pack the mould with rubber as usual, and close the flask either with bolts or a flask-press, as may be preferred. Before putting it in the vulcanizer, slack off the bolts sufficiently to allow the flask to open when the rubber expands by heat, so that it will not be forced into the gateways. After it is vulcanized, let it cool slowly until there is no steam pressure upon it ; then remove the flask, place it in the spring clamp, replace it in the vulcanizer and re-heat it to 320°, and allow it to cool slowly. It is *always* best to keep the flask in the clamp and under pressure until cold.

In this case, the mould contains more rubber than it would if held firmly, by the amount which would have been forced into the gateways by expansion as the heat was raised to the vulcanizing point ; and this amount is sufficient, or nearly so to completely fill the mould while hot and after vulcanization. The rubber is harder and not quite so tractable as when partly vulcanized, and the process requires more care and

attention than is required with a vulcanizer capable of pressing the flask at the proper time while vulcanizing; but the operator is thus enabled to test the theory herein set forth, and to satisfy himself of the benefits to be secured by putting it into practice.

This process may be varied by first vulcanizing the plate about three-fourths the usual time; then applying the pressure and re-vulcanizing to finish.

The following precautions must be observed. Any sudden change in the steam pressure may result in the formation of steam in the flask, and injury to its contents; as it is not held together as it usually is. Therefore no escape of steam, by opening the blow-off or blowing out the safety disk, should be allowed. Neither should the vulcanizer be suddenly cooled by putting it in water, or otherwise.

It is believed that the results obtained will amply repay the operator for what little additional trouble he will incur in using this method of vulcanizing.

The Dental Advertiser.

THE PLACE OF THE CEMENTS IN DENTAL THERAPEUTICS.

BY A. H. THOMPSON, D. D. S.

THE quality of the zinc phosphate cements, which is of greatest value in their employment as a filling material, is that of clinging to the tooth substance. The contact of all other materials is a mere mechanical juxtaposition which cannot be air-tight and only approximately moisture tight. Capillary attraction will draw in moisture around all mechanical fillings that depend solely upon manipulation for such a contract, except, perhaps, those of the very finest workmanship, but there are very few fillings that attain this ideal perfection. Then again, as moisture comes also from the tubuli of the dentine, drawn by capillary attraction, it follows that mere mechanical exclusion can never be absolute. With the phosphate cements not only is the external moisture perfectly excluded and capillary flow prevented, but the orifices of the tubuli are closed and moisture even from that quarter shut out.

This is apparent first in their use in lining large cavities and strengthening weak walls. It is a good rule in practice that all cavities, where depth will permit it at all, should have a layer of cement in the deeper portions. After preparing the cavity—leaving the softened dentine over the pulp—cement is carefully placed in contact with all the inside while in a sticky, clinging condition, and the cavity nearly filled with it. After hardening, the cement is cut out to sufficient depth to retain the metal filling and the margins carefully finished. In teeth of soft structure the cement lining will insure their better preservation, for it is a well-known fact that in such teeth caries will nearly always return under the metal fillings. Gold cannot be condensed against the walls sufficiently well to exclude moisture, and the dentine itself is like a sponge, while amalgam, when it prevents caries at all, does it by hardening these soft tissues, by impregnating them with the salts of its decomposition and consequent discolouration of the tooth.

The contour of the tooth can often be preserved by filling overhangs of enamel with cement, which will strongly support such weak walls, and thus reduce the size of the exposed filling. Thus the labial walls of proximate cavities in the anterior and buccal teeth should be lined with white cement to support and retain the tooth substance and give the tooth a lighter colour.

Cement is a non-conductor of thermal changes, and will prevent shock to the pulp from the too near approach of metal.

The next important quality which we notice is that by some chemical action or influence, not yet understood, the dental tissues under phosphate cement, in time, really become harder and drier by contact with it, thereby rendering the tooth better able to receive the impact of filling with gold, and more resistive of caries afterward. Probably the hardening is caused by a mere saturation of the soft tissues by the cement when liquid, but, whatever the cause, the fact is sufficiently assured to make it a practical working principle.

This hardening treatment is especially applicable for the filling of the permanent teeth during childhood and adolescence when the dental tissues are soft and immature. There are few cases in which the teeth are sufficiently dense to allow of being filled with gold with any hope of permanence, before puberty. Occasionally small fillings of gold can be made on

the grinding surfaces in dense teeth at an early age with a prospect of durability, but rarely large fillings in any position. How often have we seen large fillings fail in the proximate surfaces when put in for children, and how seldom do they succeed! Then again we must consider the danger of subjecting children to prolonged operations; and that each succeeding generation as it appears in the families of our *clientele* is less able to endure nervous fatigue or shock. Therefore we contend that the permanent teeth should be filled with phosphate cement during childhood and adolescence. The first molars for instance, which nearly always decay early, and sometimes the incisors, should be filled with cement and renewed when necessary until the teeth become sufficiently hard, and the child becomes sufficiently strong, to endure a permanent operation. As soon as possible the molars should be filled with amalgam, which can remain until after full maturity, when it can be replaced with gold.

The soft and porous nature of the deciduous teeth indicate the use of cements, especially as it is always necessary to leave as much tooth substance as possible in the direction of the pulp, for this organ is certain to perish sooner or later under large fillings in these teeth. Cement linings are necessary under large amalgam fillings to support the soft and frail walls and protect the pulp. When the pulp dies and the tooth becomes a shell, cement makes a better root filling than anything else and supports the frail tooth as no other filling can.

Another important use of the cement is in the treatment of sensitive dentine as a temporary filling material. For this it is absolutely unequalled for safety and efficiency. A sensitive cavity can be filled for one or two weeks and the sensitiveness reduced so much, in most cases, as to permit of comfortable and thorough operating; this it accomplishes probably by the exclusion of air and other irritants, the prevention of thermal shock, the neutralizing of the product of carious fermentation and the impregnation of the dentine by the fluid cement and subsequent hardening. Occasionally the pain persists, especially in nervous subjects or in buccal cavities, and the cement will need to be renewed, but it will pay to do this two or three times. If there is forced preparation and filling of the cavity when great sensitiveness exists, with or without obtundants, there is likely to be annoying after sensitiveness to thermal changes and the constant shocking

will ultimately result in congestion and death of the pulp. It may be said that no tooth which has been filled when very sensitive and remains tender afterward, is in a good condition or that the pulp is safe. Even if the sensitiveness is temporarily allayed by obtundants it will return when it recovers from the effects of the anæsthetic, and the tooth will be sensible to thermal changes. And last, but not least of the many advantages of this method of the positive reduction of sensitiveness, is the comfort the operator experiences in deliberate and thorough work without the harassing protestations of the suffering patient.

It has been objected that the cements when used for this purpose, are liable to produce death of the pulp, but it has been noticed by the writer, in an extensive use of the zinc phosphates that such a result does not occur any more frequently than with any other temporary filling material. Devitalization does not follow except when the pulp is in such a condition as to render its death probable under any filling. The precaution should, of course, be taken in exposure of the pulp, and even in very deep cavities, to interpose a protecting cover of carbolized paper, or film of gutta-percha, to prevent irritation, for no one claims that it would be safe to stop an exposed pulp with a dab of zinc phosphate or any other irritant.

It has been the writer's custom for some time to fill pulp canals with a mixture of oxy-chloride of zinc and iodoform, and like the advocates of all other pulp-canal filling materials, has had no failures with his favourite! The reason for preferring the oxy-chloride to the oxy-phosphate is obvious, in that the chloride being a powerful coagulant as well as an antiseptic, places the contents of the tubuli and the stump of the pulp at the foramen, in the best condition to resist decomposition. Then the iodoform is present to destroy any septic poisons that might arise—especially the ptomaines, for which it has a special affinity. Iodoform has been under a cloud since Dr. Black's investigations of the antiseptic power of the different popular antiseptics, but it is regaining favour as the destroyer of cadaverine, the ptomaines, and toxic products of germ fermentation. So we consider its use especially indicated in the pulp canals of teeth.

There has been such rapid improvement in the durable qualities that we can promise more permanence in mouths in which we know by observation that cement has lasted well.

In crown and bridge-work and for porcelain inlays, the quality of permanence is indispensable, and fortunately in these branches, the cement is so little exposed, either to solution or mastication, that it is serviceably permanent.

We conclude, therefore, that the zinc phosphate cements, and occasionally the oxy-chlorides, are very useful adjuncts in our work of saving teeth. That they have increased our efficiency there is no doubt, for they render it possible to preserve teeth that could not be saved before the days of the cements.

Dental Review.

THE MEDICAL COUNCIL AND THE DENTAL PROFESSION.

SIR,—It is felt by many that the time has arrived when the dental profession should be represented on the General Medical Council, and I venture to lay before your readers the reasons upon which this conclusion has been arrived at with the view of raising a discussion on the question. I trust that what follows will not be taken as a reflection on the General Medical Council, for as a profession we are much indebted to that body for the way they have aided us in the past.

It may not be generally known that the Dentists Act is administered and a register of dental practitioners and students kept by the General Medical Council; that the Council consists of about thirty members, but that the dental profession has no representative. When from time to time matters of dental interest arise, there is no one on the council with special knowledge who could be considered an authority on such matters, and a judicial body of such high authority can hardly be expected to seek outside opinion. If it be admitted that such an alteration in the constitution of the Council is desirable, there are two ways in which it may be affected: 1. The Privy Council, as soon as a vacancy occurs amongst the Crown nominees, can nominate a dentist to fill such vacancy. 2. At the next period of election the medical profession might select a dentist as one of the direct representatives. It is hardly an excessive demand that in the Council there should be an individual who, because he is a member of the dental profession, would be likely to have a more intimate knowledge of matters relating to the administration of the Dentists Act,

and be able to advise on the important matter of dental education. Such a candidate would be none the less able to consult with his colleagues on matters of general medical interest, as he should be on both the *Medical* and *Dentists' Registers*. Our desire would be that such a candidate should be nominated by and receive the support of the whole medical profession at the next election.—I am, etc.,

MORTON SMALE.

(*British Medical.*)

CANCER AND SMOKING.

SINCE the death of President Grant, a constant smoker, cancer of the tongue and cigar smoking have been closely associated in the public mind. A "prominent American physician," whose name has not transpired, is reported to have said lately : "The only cases of cancer of the tongue that I ever saw were of persons who never smoked. The majority of them were women, and the half-dozen men who were afflicted were not confirmed smokers at all." This apocryphal utterance is contrary to current opinion. There are no statistics that show clearly the relative liability of smokers and non-smokers to cancer of the tongue, for there are no data showing the relative numbers of smokers and non-smokers in any country. Surgeons of experience, however, find that the disease is far more frequent in persons who have been in the habit of smoking. The disease appears to be about six times more common in males than in females. The affection known as "smoker's patch" is common ; a good description will be found in Mr. Butlin's *Diseases of the Tongue*. It is a slightly-raised oval area on the forepart of the tongue. a little to one side of the middle line, just where the end of the pipe rests or where the stream of smoke from the pipe or cigar impinges on the surface of the tongue. The patch is usually red, but it may be bluish or pearly-white. It lasts for years, but tends to spread over the surface of the tongue if the irritation be continued. When diffused in this fashion, it constitutes leucoma of the tongue. Leucoma is certainly a predisposing cause of cancer. There is, however, no evidence to prove that smoking is the sole cause of leucoma, nor do the majority of cases of leucoma become cancerous. Hence

if smoking predisposes to cancer, it is only in an indirect manner. The smoker should never leave a "patch" untreated, and should avoid rough mouthpieces and brands of tobacco which cause irritation to the tongue.

British Medical.

SYPHILITIC INFECTION FROM A BITE.

A patient was recently shown to the Berlin Medical Society who was said to have contracted syphilis from the bite of a man. The bite was inflicted on the lip, and the wound healed in two or three days ; but in six weeks it reopened and the lip became greatly swollen. Five weeks later there was an ulcer on the inner surface of the lip with great swelling and induration round about ; the submaxillary and cervical glands were also much enlarged. After some time a typical syphilitic eruption made its appearance. By the use of mercurial frictions the swelling both of the lips and of the glands was considerably reduced.

British Medical.

A CIGARETTE IN THE BRONCHUS FOR FOUR MONTHS.

Dr. LAPEYRE mentions in a Paris medical journal a remarkable case in which an elderly gentleman, in consequence of a sudden slap on the back, unconsciously drew the cigarette he was smoking into his right bronchus, where it remained without causing any symptoms or in any way revealing its presence for nearly two months, when it set up pneumonia of a circumscribed area, and produced cardiac weakness and some œdema of the legs. After this condition had lasted without much change for about two months more, the patient expelled, during a violent fit of coughing, the cigarette, enveloped in mucus and waxy-looking matter, and then remembered that he had never found his cigarette after the slap on the back four months before. The pneumonia persisted for two or three months after the expulsion of the foreign body, and some œdema of the right leg, due probably to embolism, remained at the date of the report nearly a year later. This, as well as some other cases that have been published, appears to show that the bronchi are exceedingly tolerant of foreign bodies even when not encysted.

Lancet.

CONES AND WHEELS FOR POLISHING.

NICE cones and wheels for the laboratory, which are much more durable and satisfactory than either felt or cork, can be made by any dentist. Turn out of good dry cotton wool the sizes and shapes you want. Then cut from good, heavy chamois-skin pieces of right size and shape to cover the cones and wheels you have ready; shave down the ends of the strips thin; now coat the side going next to the wood with this cement: Glue, five parts; resin, four parts; red ochre, two parts; mixed with the smallest possible quantity of water. When mounted, lay in a cool, dry place till the cement is thoroughly set. If the instructions are followed, they can be used for carrying any polishing material wet with water.

Items of Interest.

BLOODLESS TONSILLOTOMY.

PROFESSOR J. TOISON, of Lille (Rev. de Thér. Méd. Chir., October 1st), discusses the various methods of reducing or removing the tonsils. He begins by saying that excision of the tonsils with the bistoury or the guillotine is gradually losing favour among surgeons on account of the risk of hæmorrhage. Ignipuncture with the thermo-cautery or the galvano-cautery is often useful, but should be reserved for cases in which the tonsils are only moderately enlarged and can be sufficiently reduced in one or two sittings, and for cases in which some anomaly of shape in the hypertrophied glands makes it difficult to remove them with a cutting instrument. For ordinary cases, Professor Toison uses a new snare of his own invention, which, according to him, effectually obviates all danger of bleeding. The apparatus consists of a *serre-nœud*, the metallic loop of which, instead of being free, is fixed by three silk threads to a blunt ring fixed to the distal end of the instrument. The ring is passed over the tonsil, which is then seized with forceps; the wire loop is next pulled home in the usual way, the traction being sufficient to snap the silk threads which fix it temporarily to the ring. The tonsil is thus cut through without bleeding. Professor Toison has performed this operation several times since last April; in no case has there been any hæmorrhage.

British Medical.

PROTECTION OF THE DENTAL PULP.

By L. F. KELLOGG, D.D.S.

In cases where we expect a small exposure in a deep-seated cavity of decay, the frail part of the operculum of the cavity should be first removed, that good visions may be secured and the loose cavity contents should be syringed out with tepid water, directing the stream obliquely into the cavity. The cavity should then be carefully excavated, cutting mostly from within out, and thus avoid lifting up large pieces which might cause a larger exposure than desired.

The point of exposure should be carefully guarded against accident and a soothing antiseptic and antiphlogistic remedy applied, to render the point of exposure and cavity of decay aseptic.

Recalcification of the semi-decalcified dentine will then generally take place. Avoid strong coagulants, which prevent recalcification. For a dressing various remedies may be used, as oil of cloves, dilute carbolic acid, etc., but at present I use campho-phenique, full strength. In case of slight trouble before presentment, I leave this as a dressing for twenty-four hours. In case of no previous trouble or an exposure by accident, I fill at the same sitting, but treat the cavity of decay in the same manner for a few minutes to render the semi-decalcified dentine aseptic, and destroy oral disease germs that in imagination or reality may be menacing the future health of the tooth. The principle of aseptic surgery must be followed out in either case. The material I use most in capping exposed pulps is made according to Flagg's formula for zinc sulphate. The powder consists of calcined sulphate of zinc, pulverized to an impalpable powder, one part, and calcined oxide of zinc two or three parts, and these thoroughly triturated.

The fluid consists of gum arabic 15 gr., water $\frac{1}{2}$ ounce ; after it is thoroughly dissolved add one gr. of sulphite of lime and filter.

The parts should be kept dry and a thin mix made of the cement, and a portion placed accurately over the point of exposure and the frail dentine surrounding it.

A short time should be allowed for the capping to harden, when it may be covered with oxyphosphate or any suitable non-conductor, to give sufficient depth of non-conducting

filling to break off thermal changes. The balance of the cavity may be filled as indicated.

I think when due care and skill have been used in the successive steps it is unnecessary to insert temporary tissues.

The next class of cases requiring pulp protection are more numerous, and in most cases simply met.

The layer of partially disintegrated dentine in closest proximity to the pulp should not be disturbed. After sterilizing, varnish the cavity ; especially when oxychloride or oxyphosphate cements are used, as the fluids of these cements when allowed to percolate into the porous dentine in such close proximity to the pulp, will sooner or later cause pulpitis, and subsequent death of the pulp.

Most of my failures in such cases, in the early years of my practice, I ascribe to the too close proximity of these irritating cements to the pulp without intermediate protection. The varnish lining proves sufficient protection against thermal changes in many cases, but in deep cavities is insufficient.

Cement should be used in such cases, especially where gold is to be used as the filling material, protection from mechanical injury during the insertion of the gold. There are times in amalgam work when we need a non-conductor more easily applied, equally effective, and which consumes the minimum time in its application. I think we have it in the use of asbestos in the following manner : Cut small pieces of asbestos paper about the thickness of cardboard and of the desired size. Touch one side of the pad with sardarac varnish and apply the varnished side to the desired spot ; it adheres, and more pads may be applied until the desired quantity is in position, then pack the amalgam tightly in and we have a non-conductor " par excellence " to meet a large number of cases where simplicity and expediency are especially desirable. I have used this means for some time, with very gratifying results. In amalgam work, where there is any liability of trouble from thermal changes, I can quickly apply the asbestos pad.

Perfect dryness should always be maintained throughout, as asbestos is an absorbent of moisture, and unless care is taken in this particular, it might become an irritant instead of a protection to the dental pulp.

Dental Review.

DECOMPOSITION OF CHLOROFORM IN GASLIGHT.

It has long been known that the administration of chloroform in gaslighted rooms causes decomposition of the chloroform vapour, and that the persons present suffer from irritation of the respiratory passages, with coughing, sneezing and lachrymation. Professor Kunkel (*Therap. Monatshifte*) introduced chloroform vapour into a glass chamber in which a gas was burning, and then drew off the products and analysed them. As a result, he found that the chloroform was chiefly decomposed into hydrochloric and carbonic acid, a small quantity of free chlorine being also present. As one-tenth per 1,000 of hydrochloric acid in air is sufficient to cause severe respiratory irritation, it is evident that this amount can be produced by comparatively little chloroform. Kunkel explains that irritating effects are comparatively infrequent, owing to the moisture in the air absorbing the free hydrochloric acid, and combining with it. Cloths or sheets dipped in a solution of washing soda, and hung up in the operating room, will absorb any hydrochloric acid or chlorine, and thus obviate their unpleasant effects.

British Medical.

URTICARIA OF THE TONGUE.

DR. BOCK (*Monats. f. prakt. Derm.*,) states that he was called to a man, aged 38, who presented an appearance of slight asphyxia, and who breathed with great difficulty. The swollen tongue filled the whole of the mouth, and could scarcely be protruded. The colour was bluish and shining, and the papillæ had disappeared. The consistence of the tongue was hard and elastic. There was no abnormal heat, nor pain, nor burning. The affection had appeared suddenly and spontaneously. For some years the patient had suffered from frequent attacks of urticaria, which either occurred without cause or as a result of eating shellfish. The author prescribed a hot mustard footbath, and injected subcutaneously half a milligramme of atropine. After two hours the breathing became easier, and in the course of the day the swelling of the tongue disappeared.

(British Medical.)

ANODYNE EFFECTS OF ELECTRIC LIGHT.

DR. STANISLAUS TH. VON STEIN, of Moscow, records (*Meditzinskoie Obozrenie*), a series of 14 cases of various painful affections in which he used electric light as an anodyne, with almost "magical" results. The apparatus (devised by himself) used for the purpose consisted of a small-sized (three or four volts) incandescent electric lamp, furnished with a suitable handle and a funnel-shaped reflector, varying from 3.5 to 6 centimetres in length and from 2 to 3 in the longest diameter, the lamp being fixed within the reflector. In cases where the head or neck was affected, the illumination (the reflector being applied directly to the painful area) lasted from ten to fifteen seconds; in other regions of the body from one to five minutes, or even longer, until the patient began to complain of intense heat. The anodyne effects are said to have been invariably most striking. A woman, suffering from very obstinate intercostal neuralgia, after a single sitting (a series of illuminations, each of a few seconds' duration) was completely and permanently freed from pain. The same result was obtained in another patient suffering from intense rheumatic pains about the shoulder. In a woman, aged 50, suffering from agonising lumbago, four sittings of five minutes' duration twice a day proved equally successful. In another patient, a nervous woman who had had excruciating pain about the right foot and ankle causing lameness, two illuminations of five minutes' duration caused complete cessation of the symptoms. In a patient suffering from pulmonary and laryngeal tuberculosis, and most troublesome, almost incessant, cough, in whom even morphine in the daily dose of one grain had afforded but trifling relief, from ten to fifteen seconds' illumination of larynx and both sides of the neck externally, repeated every other day, reduced the paroxysms of coughing to two or three in the twenty-four hours.

British Medical.

THE MEDICAL ART IN ANCIENT EGYPT.

AN interesting chapter in the legendary history of medicine was opened up recently by Dr. Grant Bey of Cairo at a meeting of the Aberdeen Medico-Chirurgical Society. The subject that of ancient Egyptian theory and practice, was, indeed,

sufficiently archaic to guarantee that it should not be too familiar to attract and instruct even a cultivated audience. The lecturer directed his attention chiefly to a consideration of the work of embalming. In this connection he carefully explained the different methods pursued, the *rationale* of the process, and the results attained. We shall not now enter into these details, but we note with satisfaction that one important collateral matter, that of Egyptian sanitation, has not been overlooked. The impossibility of anything like soil contamination under a system which converted burial into a mere process of antiseptic preservation is obvious. Though certainly less efficient for this purpose than the destructive agency of cremation, it was probably superior to the many imitative methods introduced by modern mummifiers. When the body had been prepared by means of evisceration, stuffing with bitumen, cassia, myrrh, &c., immersion, virtually pickling, for a further term of seventy days in salt, and bandaging in cloth cemented with gums—the series of arrangements under the most perfect system employed—there obviously was little chance of putrefactive decay or infective mischief arising from it. But it was not thus alone that the ancient possessors of Egypt yielded an unconscious obedience to scientific laws which are only now finding their full explanation. They were also most scrupulous in guarding their sacred river against the entrance of impurity. Though some allowance must be made for the fact that such questions as the disposal of sewage must have been simpler of settlement in the days of the Pharaohs than in our own, the example of their more cleanly practice in this respect might well be copied by modern vestries and riverside proprietors. Egyptian medicine has not handed down to our time many valuable traditions. We know, however, that within the scope of the professional magic which worked its “curves” in the temples of Isis, the present fashionable novelties of bath treatment, massage, and hypnotism were carried out with elaborate care. So the cycle of time, while it bears us on to new and newer spheres of discovery and activity, ever keeps in touch with those vital conditions which underlie all treatment and are never irrational, save when they are misinterpreted.

Lancet.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The last Ordinary Monthly Meeting of this society took place on Friday, October 10th, at 8 o'clock, p.m. P. W. Greetham, Esq., *President*, in the chair.

The Minutes of the previous meeting were read and confirmed.

The president read out the names of the following gentlemen, who were proposed for election as members : Messrs. Barrett, Canton, McFarlane, Nicholls and Slight.

The following visitors were present, and received the usual form of welcome from the President : Messrs. H. C. Canton, W. H. Slight, A. Wells, W. Whiteman, H. B. Rowe, C. Masters, H. Kublar, R. Nicholls, Gask, Clarence Read, and Stanley Read.

The Ballot for Messrs. Jayakar, Masters and Rowe, then took place : it was successful in all three cases, and the gentlemen were elected.

CASUAL COMMUNICATIONS.

Mr. CARTER shewed three models of supernumerary teeth.

Mr. CLEMENTS, a geminated lower molar and bicuspid.

Mr. MASTERS, a very interesting case of an upper temporary canine root through the apical foramen of which a straw had become passed to the extent of about half an inch.

Mr. CLARENCE READ, four specimens, (1) A four rooted temporary upper molar ; (2) A two-rooted 2nd upper bicuspid ; (3) a three rooted lower molar ; (4) Lower bicuspid shewing dilaceration of the root.

No more Casual Communications coming forward, the President called upon Mr. ROUGHTON for his paper on "The Early Diagnosis of Surgical Affections of the Mouth," which proved to be of a highly interesting nature, being accompanied by a series of diagrams, which Mr. Roughton very kindly presented to the Library.

After a few remarks on the part of the President, a discus-

sion took place in which the Dean, Messrs. Humby, Spokes, Stanley Read, and A. Moore joined.

Mr. ROUGHTON having replied, and hearty vote of thanks having been tendered him, the meeting adjourned until Friday, Nov. 7th, when Mr. W. J. FISK, will read a paper entitled: "Cleft Palate."

LIVERPOOL DENTAL HOSPITAL STUDENTS' SOCIETY.

The first meeting during this winter session of the Liverpool Dental Hospital Students' Society was held on Wednesday, October 14th. R. EDWARDS, Esq., (President), in the chair. A large number of members being present.

The president announced the receipt of a number of valuable books and models from Mr. E. M. Phillips.

Mr. NORRIS showed some models of Regulation Cases.

Mr. FRED DOPSON shewed some abnormal molar teeth.

Mr. GILMORE then read a paper on "Root Filling," which was afterwards discussed by Messrs. Edwards, Bates, Norris, Osborn, Roberts, and Black.

After a vote of thanks to Mr. Gilmore for his paper, the president announced that the next meeting would be held on Wednesday, November 19th.

Dental News.

SIR EDWIN SAUNDERS has become Treasurer of the Dental Hospital of London, the place of the late Mr. R. C. L. Bevan.

Mr. J. H. TARGETT, F.R.C.S., has been appointed Pathological Curator of the Museum of the Royal College of Surgeons, in succession to Mr. F. S. Eve, resigned.

A LADY, Miss Anne Felton Reynolds, received the first prize for senior honours at the Boston Dental College.

A telegram from St. Petersburg announces that Dr. Koucharsky, a young professor of medicine, had just ended a lecture on acids when he poured some drops from a phial into a glass. "Attention, young men," he said ; "in two minutes you will see a man die. Good-bye to you all !" He drank the liquid, drew out his watch, and counted the seconds until he fell to the ground a corpse. The students were speechless and motionless ; when they at last tried to apply antidotes it was too late. Professor Koucharsky was dead.

At the half-yearly sittings of the Dental Board of the Faculty of Physicians and Surgeons of Glasgow held in October, the following candidates were admitted licentiates in Dental Surgery :—

Francis Burton, London ; Clarence A. Hodson, Birmingham ; Alexandria Naismith, Glasgow. Arthur Sutcliffe, Bradford ; James W. Summers, London ; William H. Wheatley, London.

Two candidates were referred.

Dr. J. COWAN WOODBURN, lecturer on Dental Surgery at the Glasgow Royal Infirmary during the run of a Post Graduate course of medical and surgical operators invited dental practitioners and the students of the Dental Hospital to his lectures and demonstrations. Last Saturday he described and operated upon an Epulis of a presumed osteo-fibroid character, showing that the happy issue of any operation was based upon the anatomy and physiology of the parts concerned, and a knowledge of the pathological changes which took place in tissues in any conditions that is embraced under the term "disease."

In the case in point, he described how the simple hypertrophy of the fibrous element of the tumour was brought about by the increased proliferation of the elementary tissues.—an augmented activity induced by an increase supply of nutritive material again induced by some determining excitant. The osteal nature of the tumour he showed to take its origin from the periosteal and endosteal lining membrane. The removal of which was necessary for the complete eradication of the diseased action.

He then proceeded to remove the tumour, which was done under the influence of nitrous oxide gas, using the scapel the base of the mass stretching from the middle line to the space be-

tween the bicuspid and molar. With the dental engine he then removed the alveolar margins along the aforesaid line (and a little beyond) to the extent of one fourth of each tooth previously embedded in the hypertrophied mass.

By this procedure he pointed out that by basing the treatment on a correct pathological assumption that this variety of tumours may be excluded from the non-recurrent class.

No. 6850, series 3, in collection of official laws and decrees of the kingdom of Italy, contains the following :

HUMBERT I,

By the grace of God and will of the nation King of Italy. Seen the laws of 13th November, 1859, No. 3725 ; 16th February, 1861 ; 8th October, 1876 ; 22nd December, 1888 ; 9th October, 1889 ; and with the intention of establishing fixed rules and identical methods of conferring the diploma of dentistry in all the universities of the kingdom ; having conferred with our Council of Superior Instruction, having heard the Council of State on the proposition of our Minister Secretary of State for Public Instruction and Secretary of State for Internal Affairs,

We do hereby decree—

ART. 1. Whosoever shall desire to practise dentistry or phlebotomy must have the degree in medicine and surgery.

ART. 2. The teaching of dentistry shall be imparted in the surgical institutes of those faculties in our kingdom who can demonstrate having the necessary means and persons capable of such teaching according to the most recent progress of the speciality.

ART. 3. The nominations of teachers shall be made according to the existing rules for the appointment of professors extraordinary after having heard the opinion of the Superior Council.

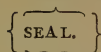
ART. 4. Those who have undertaken courses in dentistry or phlebotomy, previous to the publication of this decree, can finish and obtain their degrees under the rules in operation at the time of their entry. They also, as well as dentists already in practice, can continue under the Art. 60 of the law of 9th October. 1889, No. 5442 (series 3).

We order that the present decree, furnished with the seal

of state, be inscribed among the official laws and decrees of our kingdom, and be it seen that this law shall be observed.

Given in Rome, April 24, 1890.

HUMBERT.



BOSELLE.

CRISPI.

Commenting in the *Cosmos* on the above Dr. Von Marter says: "Every matriculant in the medical department of any university in the kingdom of Italy must possess the degree of A.B. The medical course for the degree of M.D. continues through six years, after which the law will regard the graduate as prepared to enter upon the study of dental science and art."

On Monday evening, October 20th, Dr. Miller, of Berlin, occupied the chair of Operative Dental Surgery, at the National Dental Hospital. He delivered his lecture on "Experiments on the comparative value of various antiseptics in the treatment of diseased teeth," which has already been published, and an abstract of which appeared in our issue of September 1st. The practical object in view, whilst performing these experiments, was, Dr. Miller said, "To find some means whereby pulps, which have been to be devitalized in consequence of their exposure, could be prevented decomposing, thus saving the need for their removal, and so shortening the time required for treating a tooth. This would, of course, bring such an operation within the means of poorer folk, and so it was hoped that thousands of teeth now lost may be saved."

Mr. Howard Mummary illustrated the lecture by some Lantern Projections. He also threw on the screen a photomicrograph of a section of artificial caries prepared by Dr. Miller. This showed quite distinctly the "broken pipe-stem appearance, which has been said not to be produced in caries artificially induced, and hence has been regarded as a sign of "vital action." Dr. Miller states, that he proposes to work out the practical application of his idea during the coming winter, in his clinics at the Berlin Dental Hospital; he will make the results known. An informal discussion ensued, which more or less wandered away from the object Dr. Miller has in view, but which served to bring out the facts; that he has experimented with pulps already decomposed and his opinion as to the worthlessness of iodoform is unchanged;

that he has no fear of Perchloride of Mercury passing through the apex ; that, as far as his experiments go, he is disappointed with the action of arsenic. Dr. Miller corrects a point in his paper, under the heading "Antiseptics pre-eminently active in preventing decomposition of pulp-tissues" (see our issue September 1st) for "Oil of Cloves" he should have written "Oil of Cinnamon."

LEGAL.

FIGHT IN A DENTAL SURGERY.

BEFORE Mr. Slade, at the North London Police Court, James Stamford Cook, a traveller, of Defoe Road, Stoke Newington, was summoned for assaulting and beating James Kemp Devonshire, a dental surgeon, of Church Street, Stoke Newington. The complainant said that a week ago the defendant came to his house in an excited manner, struck him a violent blow in the face, and attempted to drag out one of his (witness's) eyes. In cross-examination the complainant denied that he had insulted the defendant's wife. The fact was he had some false teeth made at a cheaper rate than ordinary, and, in consequence of biting on one of these (after nearly two year's wear), one of the teeth broke. The lady brought the teeth back, and said they had been guaranteed not to break, but this was not so, because no professional man who was a licentiate of the Royal College would give such a guarantee. He told her he would repair the broken tooth, and then she did not want to pay his charge. She wasted so much of his time that he did open the folding doors between his surgery and waiting room and show her out, but he did not insult her. He was bound to end the conversation, because he had steam machinery at work which wanted attending to. The defendant came at night, and began abusing him, and when he (complainant) ordered him out, the blows mentioned were given. The defendant was dragging at his (witness's) left eye, and when he asked him to desist, the defendant said that he came there to resist. Mr. Young, for the defence, said both parties were evidently excitable men. The magistrate ordered the defendant to enter into his own recognisances of £5 to be of good behaviour for three months, and to pay 23s. costs.

APPOINTMENT.

Mr. Gordon Hooper, L.D.S., Eng. has been appointed Consulting Dental Surgeon to the Bolingbroke House, Pay Hospital, Wandsworth Common.

ROYAL COLLEGE OF SURGEONS, DUBLIN.—The following gentlemen having passed the necessary examination have been admitted Licentiates in Dental Surgery of the College :—

Albert Edward Emery, (Longton, Staffordshire) ;
 John Westwood, (Handsworth, Staffordshire) ; and
 George William Wood, (Retford, Nottinghamshire).

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

ON THE POSSIBLE DURABILITY OF GLASS INLAYS.

To the "Editor of the British Journal of Dental Science."

SIR,—Seeing that my opinion is asked as to Dr. Richter's new "Glass Filling," I can only frankly admit that all my own experiments in searching for a low temperature gum-enamel for continuous gum work were unsuccessful—not that I think those I found would have lost colour or been dissolved in the mouth, but because I could not overcome the tendency to "crack" in cooling.

I can only hope that Dr. Richter has fully succeeded where so many have failed, for his system of preparing his little properly coloured glass plugs to perfectly fit the cavities which they are intended to fill, is the essence of ingenuity and simplicity, and if carefully performed, makes the most satisfactory fillings for cavities in sight that it has ever been my fortune to meet with.

Dr. Richter has no doubt tested his glass material to the fullest extent possible before introducing it to the profession, but even should the "test of time" prove that its colour fades, it merely means that a higher fusing glass will have to be used with a simple spirit blowpipe, instead of the spirit lamp. The ingenuity, simplicity, and beautiful effectiveness of Dr. Richter's system will remain the same, and our gratitude to him as much his due as ever.

That a sufficiently fusible material for easy manipulation—that will stand the test of wear—is obtainable, was proved years and years back by Messrs. Ash & Sons, when they made teeth of every shade *with gold tubes*.

Congratulating Dr. Richter on the success of his labours.

I remain, Yours faithfully,

GILBERT WALKER.

TRESPASSING DENTAL TITLES.

To the Editor of "The British Journal of Dental Science."

SIR,—As you have deemed well to detail and criticise the subject of "A Higher Dental Diploma," I cannot but think that now is also a fitting and due time to consider the outburst of assumed titles and egregious trespass. By this I mean the appending to names of simply Registered Dentists, the letters, R.D.S., which presumably means, Registered Dental Surgeon, and is no title or qualification at all: thus contemptuously leading the public to believe that the WORTHY possessor of such an apparent title is equally qualified to (if not better than) the legally qualified L.D.S. I state this with no feeling of jealousy, but as seriously affecting the public and the profession, and that it therefore calls for earliest consideration and radical alteration.

In London, in provincial towns, in fact the country through, we find men (possibly worthy of a qualification, but conspicuously short of it) attaching to their names, their photographs, rough prints and advertisements, the letters R.D.S. Now this can but be done with the one and sheer intent of leading the public to believe that they are equally qualified to the possessor of the L.D.S. diploma, which is a guarantee that the holder is a man proven to be able to practise the art of Dentistry, whereas the former assumed title means nothing more than that the individual had the privilege of being placed upon the Dental Register by virtue, that prior to 1878, he had been engaged to a greater or less degree, in Dental work; hence, as there is a very apparent trespass, or close encroachment on the qualified man's legal rights, and on the credulity of the public, would it not be well to first try and rectify such an evident disgrace before seeking a higher qualification, etc., for among the present R.D.S.'s (if I may be pardoned for using such a distinction?), may be found men ranging from door-porters to ministers of religion. With this fact in view, can it be reasonably expected that the whole multitude of Dentists can run smoothly in harness with the Medicals, whereas the merited L.D.S., certainly deserves its due status. In broaching this subject, I have full confidence that I shall have much support and sympathy, for in my own practice I am constantly meeting with patients who have been deceived by the strikingly apparent equality of R.D.S. and L.D.S.; and among my professional brethren, I find great annoyance is felt, that men should be at liberty to so mislead. And in fairness to the R.D.S.'s, I ask, if the privileged distinction granted them, of Dentist, &c., is not sufficient, what can the true motive be in assuming the title R.D.S., except the one I have stated.

I am, Sir, yours faithfully,

SURGEON.

DENTAL MICROSCOPY.

To the Editor of the "British Journal of Dental Science."

SIR,—The subject of Dental Microscopy being now so much before the profession, may I venture to ask for space in your columns for a few remarks on methods of preparing sections. Mr. Mummery's process, recently described, bids fair to supercede all others. Having taken it up at once, on receipt of the number containing the report of the meeting at which it was introduced, I have already had some experiences of the advantage to be derived from it. I would suggest staining with the alcoholic solution of Hæmatoxyline prepared by the formula given in Stirling's "Section Cutting." My own sections thus stained have not been uniformly successful, but I think the failures are owing to my own incompetence, and not to the process. I have succeeded in preparing very thin sections by Mr. C. White's method, the plates of glass used, being ground by myself, by rubbing two perfectly flat pieces of plate glass together with emery, flour and water. This gives a very fine ground surface, and if very carefully levigated pumice is used, only care and patience are required to produce successful results. One objection to the process is the time it requires, but by keeping all the solutions in one-ounce wide-mouth, stoppered bottles, and passing the preparation from one to the other as required, this objection is to a great extent got over.

For those who still wish to try the decalcifying process, I can confidently recommend the following, which I have used some time with good results. The teeth are decalcified either in alum solution, with Hydrochloric Acid, (Mr. C. White's process,) or in Chromic and Nitric Acids. When soft they are thoroughly washed, and then, if necessary, stained. They are now soaked in Mucilage, of the strength of syrup for 24 hours, and then placed in small moulds of blotting paper, just big enough to receive them. The mould is filled with mucilage, and the whole hardened in spirit embedded in paraffin, and cut in the Microtome. By this process, I have obtained very thin sections of hard and soft parts together, but, of course, some skill in handling the knife is necessary, and success is only to be obtained after many failures. I should strongly advise every student, who has not done so already, to get a good microscope, and learn how to use it. I often envy the London students the advantages they enjoy with so many advanced dental histologists, all of whom are, I believe, always ready to assist the beginners around them. This advantage is, in most cases, lost when the period of study is over, and the student goes, perhaps, far away to establish himself in practice, so I would say to one and all,—“Make the most of your opportunity, and get a good grounding in histological work, and in after life you will reap the advantage in a study, perhaps, the most interesting, which any man can take up.”

Trusting that something in this letter may prove of interest,

I am, Sir,

Yours, &c.,

JOHN P. GUY CUNNINGHAM.

Paarl, Cape Colony.

British Journal of Dental Science.

No. 548. LONDON, NOV. 15, 1890. VOL. XXXIII.

NOTES ON METHODS OF INTRODUCING GOLD FILLINGS.

By JAMES F. COLYER, L.R.C.P. ; M.R.C.S. ; L.D.S. ;
Demonstrator Dent. Hosp. of London, and Assistant Dental
Surgeon to Charing Cross Hospital.

(Continued from page 969.)

Having considered briefly the various instruments used, we will pass to the consideration of the actual filling of the cavity.

In this country two forms of gold are generally employed, viz., Tape and Pellets.

The Tape is usually obtained by folding up sheet gold to the required thickness, though some firms now sell the gold ready folded up, when it only requires cutting to be ready for use.

Gold Foils are numbered according to the weight of the sheet ; thus a sheet of gold measures 4 ins. square, and if it weighs 4 gr. it is termed No. 4 thickness, if 8 gr. No. 8 thickness &c., so that when we speak of 48 tape, we simply mean tape of such thickness, that if we had a sheet of gold of the same dimensions it would weigh 48 grains.

Now the tape usually employed is from 32 onwards, and this may be obtained by folding a much thinner foil to that thickness. Thus, supposing you wish to use No. 32, you would take a sheet of No. 4 foil and fold it once so as to make it No. 8 thickness, then again to make it No. 16, and again to take it to No. 32. When using thicker foils it is useful to fold two or three sheets at once. Instead of thin foils thus folded, some use heavy or rolled gold of thickness averaging from 20 to 60 ; this form is extremely cohesive, and useful for

contouring, but it is not so easily worked, and does not adapt itself to the cavity so well as tape prepared by folding.

For folding gold a pad and foil knife will be required; these can be obtained at any of the dépôts, care being taken that the edge of the foil knife is perfectly straight.

Having folded the gold, the next step is to cut it into strips, and an easy method of cutting it quickly and regularly is as follows :—

Take the folded gold in a pair of tweezers, held between the thumb, first and second finger of the left hand, then take the foil scissors in the right hand, resting the lower blade on the 3rd and 4th fingers of the left hand, by this means the scissors are steadied and the gold may be set to any width desired.

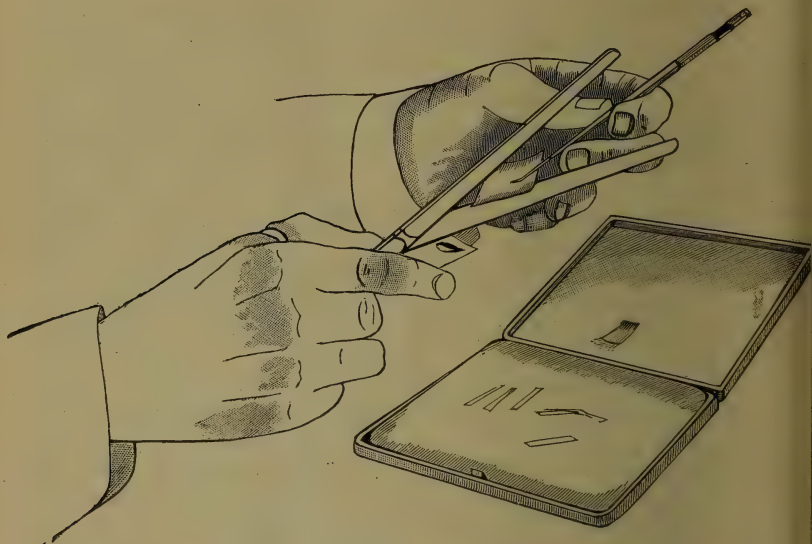


Fig. 7.

The thickness of gold used varies; for retaining pits and difficult cavities No. 32, for more accessible places Nos. 48, 64, 96, but in using the heavier foils considerable practice is required. The width of your strips also varies, for retaining points a strip practically as fine as can be cut —; for difficult cavities, — and for more accessible places according to the breadth of the cavity.

The other form of cohesive gold, viz., pellets, requires but short notice. There are numerous makes in various shapes and sizes, the cylinders are the most useful form, and of these Wohrab's are as nice as any, they are semi-cohesive, working softly and easily.

As to choice between the use of Foil and Pellets, considerable difference of opinion prevails. To my mind, foil is without doubt the better, especially for building over edges and contouring. Those, however, who use pellets, claim that they are easier and quicker to work. In some cases they may be a little easier to work at first, but as to quickness there is a doubt, when one is able to manipulate foil of 64 thickness onwards, with the electric mallet the advantage of tape over cylinders in saving time is considerable.

In using cohesive gold care should be taken to avoid touching it with the hands, since moisture, grease, and exposure to air, destroy its cohesiveness. Though foils are sold as cohesive, it is always best to pass them through the flame before working, and for this purpose use a spirit lamp. A Bunsen burner leads sooner or later to failure, the cause no doubt being due to the impurities contained in the gas. In annealing take care not to overheat the gold, since many kinds become harsh in so doing. Good cohesive gold can be annealed to a dull red heat without becoming harsh.

Having passed in review a few general points as to the material used, we must next consider the filling of each class of cavity separately, but before doing this, it may be well to mention the two general methods in use for starting cohesive plugs, viz., the one by using starting points, and the other by wedging a large cohesive cylinder into the base of the cavity.

The former method is generally employed for starting fillings, in front teeth, and approximals in bicuspid, &c., when filled with cohesive gold throughout; the latter method principally in crown cavities, where in drilling starting points you run a risk of injuring the pulp.

For facility of description, we will consider the filling of cavities under three main heads, viz., (1) filling crown cavities; (2) approximal cavities in molars and bicuspid; (3) approximal contour cavities in front teeth.

Crown cavities.—These cavities occurring typically in molars, are best started with cylinders. The method being this; take two or three large cylinders according to the size of the cavity, and place them ends upwards in the cavity,

then with a suitable plugger tack the cylinders round the margins of the cavity, leaving the centre till last. By this proceeding the cylinders are only slightly condensed, but the gold is got into a suitable position. Now take a plugger in the left hand (the pattern is of no importance) so as to steady the cylinders, whilst with the use of firm pressure, first round the edges in direction towards the walls, then in the centre gold is closely condensed.

It is extremely useful to condense with these cylinders a strip of cohesive tape, the latter enabling the operator to start his cohesive tape more easily.

The cylinders being steady, anneal a piece of tape by gently passing it through the flame (keeping the part between the tweezers in the flame a little longer than the other); place it in the cavity and condense with suitable pluggers, using either hand pressure or mallet force. In condensing, fold the gold over so that each fold lies parallel with the floor, and exert the force in a direction as far as possible towards the walls of the cavity. The piece being in position, fresh portions are added, and thoroughly condensed until the cavity is full.

In malletting, the force of the blow should be directed towards the walls of the cavity, the most inaccessible parts being filled first, and the filling kept if anything a little higher towards the walls than the centre.



Fig. 8, showing loop hanging down.



Fig. 9, showing loop malletted down.

Now it is impossible to build the gold so accurately as to bring it exactly flush with the edges of the cavity, hence it becomes necessary in filling to mallet the gold over the edge, and when the plug is completed to cut down the surplus by means of burrs and corundrum points.

The operation of building over the edges is the most important, and at the same time the most difficult part of a filling to execute with accuracy and nicety. It is best accomplished as follows :—

Tack down a strip of gold near the margin of the filling, and having carried the tape over the edge reflex it again over the same spot. (Fig. 8.) A loop of gold is thus left simply hanging over the edge, first tap this loop down gently, and then mallet, taking care not to use too much force. (Fig. 9.)

Having built over all the edges and filled up the centre of the cavity to the light level, the next step will be to trim the filling by cutting down the surplus over the edges, smoothing the surface and polishing. For this purpose finishing burs and corundrum points are used, the former for cutting away the surplus over the edges, the latter for smoothing the surface. In using these, care should be taken to cut in a direction from the filling to the tooth, rather than from the tooth to the filling, for this reason, in the former direction one is likely to burnish the gold over the edges : in the latter to tear the gold away from the edge.

Having trimmed the edges, turn your attention to the bite and see that the filling is not high (a most important point). Having ascertained that the bite is not obstructed, smooth the surface first with a corundrum, and then with an Arkansas or Hindostan stone, the object of the latter being to remove scratches and so produce a higher finish ; finally finish with some pumice on either a wooden or rubber point. The various steps in filling a molar are diagrammatically illustrated in Figs. 8 to 13.)



Fig. 10, showing how to start big wedging cylinder at base.



Fig. 11, showing how to build, keeping gold a little higher against the walls than in the centre.



Fig. 12, showing how not to build not to keep higher in centre than at sides.



Fig. 13, showing time to build over edges.



Fig. 14, showing the Cavity filled ready for trimming.



Fig. 15, shows the filling completed.

It should be borne in mind that in trimming the edges we endeavour to get a joint between the enamel and gold so perfect that the finest probe passed from the filling to the tooth or *vice versa* does not catch. The edges being considered trimmed when the probe passes over all the parts without catching.

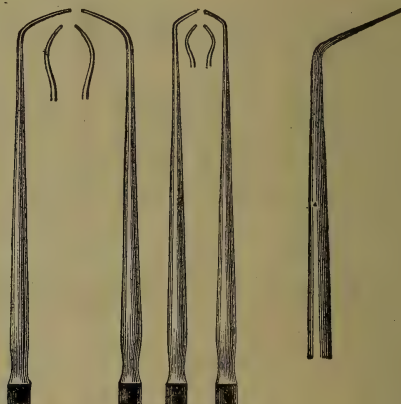


Fig. 16.

Useful shapes and sizes of instruments for finishing are shown in the following :—

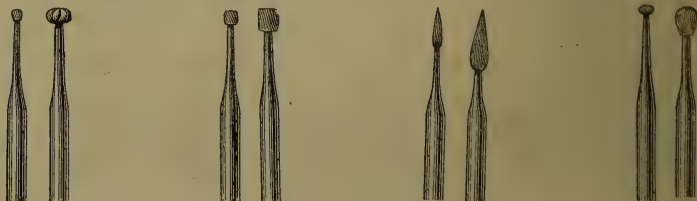


Fig. 17, representing Finishing Burs.

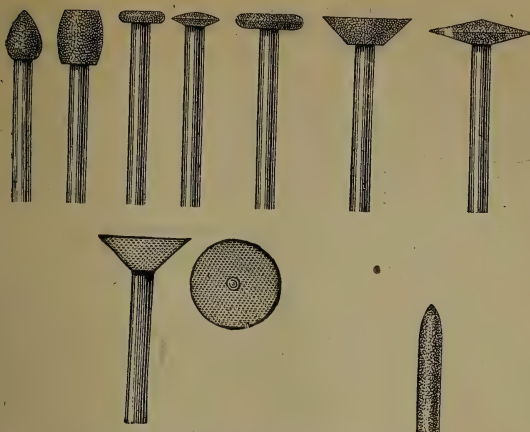


Fig. 18, Corundrum Points.



Fig. 19, Wood Points. (Dr. Southwood.)



Fig. 20,
Port Polish for
carrying Wood
Points.

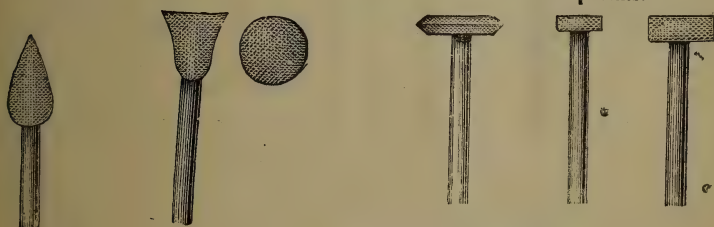


Fig. 21, Useful Hindostain Stones.



Fig. 22, Rubber Points-

Approximal cavities in bicuspid and molars.—These cavities are best started by retaining pits, one at either angle of the cervical edge.

For filling these pits, tape will be required of about No. 32 thickness, the breadth being the same as that of the pit to be filled. The best shaped instrument for filling are those illustrated in Fig. No. 1, of Webb's set, shown in Fig. 22, and



Fig. 23.

Rogers' retaining point plugger, the point of importance, being that the plugger should be a little smaller than the diameter of pit, so as to overcome the tendency of the former, and cut the gold when filling. In annealing this piece of gold, the end contained in the tweezers sometimes does not get thoroughly annealed. This may be avoided by first annealing the strip of gold, holding it by one end, and then having taken it up by the opposite end, again passing it through the flame. Having annealed the strip, by means of the tweezers, gently lay it over the orifice of the pit, then with the retaining point plugger invaginate the gold into the pit, and in removing the instrument, give it the slightest amount of rotation (this will avoid bringing out the gold with the instrument). The gold is now tucked in, in successive folds, until the cavity is full, firm pressure being used as this point is necessarily one of the most vital in the filling. Having filled the retaining pits, bridge the gold across from one to the other, condensing the foil in layers parallel to the floor.

The next step is to build from this bridge of gold, in a direction towards the cervical edge, using exactly the same methods as described under crown cavities, and having looped the foil over the edge, it is an excellent plan to chop off with the mallet (electric or hand) any superfluous material, thus, to all intents and purposes, burnishing the gold against the edge.

Too much care cannot be bestowed on this part of the cervical edge, as it is far and away the most important part of the filling.

This operation being satisfactorily completed, continue adding fresh pieces of foil, until the cavity is full, keeping the gold flat, and if anything, a little higher against the walls

than on the centre, and a little higher on the contour surface than the medium line of tooth.

The edges are built over as the cavity fills the crown surface and edges bring completed last.

In filling these cavities build out contour, restoring as far as possible the original shape of the tooth.

The finishing of these fillings is accomplished as follows :

The cervical edge and upper part of the plug are first roughly trimmed down with plug trimmers; some useful shapes are shown in Fig. 18. They are used so as to cut in a direction from the gold to the tooth substance for reasons previously stated.

Strips of emery tape should now be used in a lateral direction on the approximal and cervical portions of the filling.

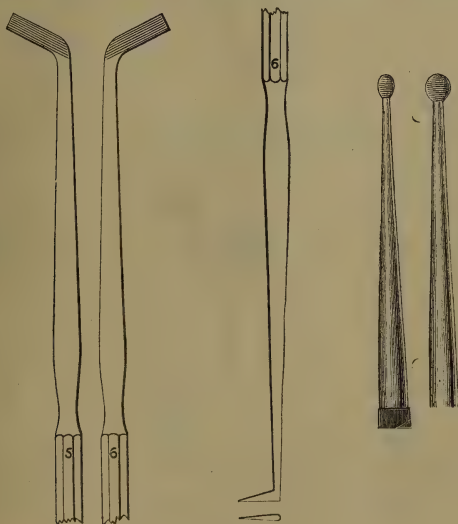


Fig. 24.

To make sure that the cervical edge is thoroughly finished it will be necessary as described under crown cavities, to test with probes, and where ever a catch is discovered the tape or plug trimmers must be again brought into use.

The lower part of the approximal surface may be trimmed down with a disc of emery, and this part of the filling is also best finished with emery tape as one can more easily get a nice contour with this than discs. If discs are used to finish

the cervical margin it will be found extremely difficult to prevent destroying the contour of the filling.

The crown surface is trimmed and polished in exactly the same way as described under crown cavities. The contour surface is polished with either a little pumice on ordinary sewing tape, or with rubber caps and discs on the Engine.

Figs. 25 to 30 represent the various stages and steps below described.



Fig. 25, shows retaining points filled.



Fig. 26, shows gold bridged between retaining points.



Fig. 27, shows gold built over cervical edge.



Fig. 28, shows how to build, keeping a little higher against sides than in centre.



Fig. 29, shows cavity full.



Fig. 30, shows the cavity completed.

Approximal contours in front teeth :—

In these cavities great care must be exercised in getting the gold in absolute contact with the front wall of enamel in order to avoid that bluish appearance sometimes seen in front teeth filled with gold.

In filling, the method of procedure should be as follows :—

First fill the retaining points at the cervical margin, bridge between them and build over cervical edge as recommended above.

Next build the filling down a little way, contour to required shape, and taking especial care to fill well posterior wall (Fig. 33.) Now finish filling in the actual cavity (or hold for the filling) taking especial care to fill into any grooves if they exist, and also with the opposing point. (Stage is represented in Fig. 34.) Next build over the posterior wall and edge, taking the filling out to the required contour (Fig. 35) and this accomplished, fill the tooth in, first building over anterior edge, and out to the required contour.



Fig. 31, shows side and front view of cavity.



Fig. 32, shows retaining points filled and bridged between.



Fig. 33, shows tooth built down slightly and contoured.



Fig. 34, shows actual cavity filled in.



Fig. 35, shows posterior wall built over.

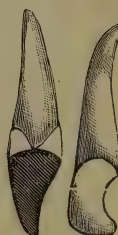


Fig. 36, shows filling completed.

One recommends building over the posterior edge principally because the tendency is, if very careful attention is not bestowed, for the operator to build the filling out contour in front, leaving the posterior wall, which is excessively difficult to get at when the filling is completed in front.

These fillings are best finished with plug trimmers and tape at the cervical edge, discs and tape for the approximal surface, small corundrum wheels for trimming the anterior

surface, oval finishing burrs, and small corundrum wheels the post surface.

For polishing, pumice on rubber points, or ordinary sewing tape, should be used.

In the foregoing description, no attempt has been made to explain, in accurate detail, the filling of cavities, but rather to glance over the order of proceeding.

There are of course many other shapes of cavities, requiring filling, beside those described, but the method is practically the same, viz.:—

(1) To fill retaining points when present.

(2) To bridge across between them, and then build over the cervical edge.

(3) To build the filling up as level as possible, keeping it, if anything, a little higher against the walls of the cavity, than in the centre.

(4) To build over the edges as the filling advances.

(*To be continued.*)

VIRULENCE OF SALIVA BEFORE THE ONSET OF RABIES.

MM. ROUX and MOCARD (*Concours Médical*, October 18th, 1890) have made experiments with the view of determining whether persons bitten by an animal which show no signs of rabies at the time of the bite, but “goes mad” three or four days afterwards, are in danger of developing hydrophobia. They point out that the onset of rabies in dogs, for instance, is not sudden; there are premonitory symptoms which generally do not excite attention. In particular, some days before the disease declares itself there is a rise of temperature without any change whatever in the appearance or ways of the animal. MM. Roux and Mocard inoculated dogs with rabic virus, and as soon as the temperature began to rise, they collected the saliva and injected it into healthy dogs. In this way they proved that at least three days before the animal showed any alteration in his condition, the saliva contained rabic virus, and produced rabies in animals inoculated with it. They conclude that a dog may communicate the disease by biting or licking when he himself appears to be entirely free from it.

British Medical.

TREATMENT OF CHILDREN'S TEETH.*

BY Mr. W. MAY.

Mr. President and Gentlemen,—In bringing before your notice to-night the subject of "Treatment of Children's Teeth," I am fully conscious of inability, through inexperience, to render it justice. I should like to have been able to supplement my remarks by the lessons accorded by the results accruing from an extended practice; to have concentrated on them a broader knowledge than that which falls to the lot of a dental student; but the paramount importance of the subject, brought vividly home to me as the result of a few months dresserships in our extracting room, where often may be seen children (*beaux enfants jusqu'aux dents*) the state of whose mouths, from decay and premature extraction is a pitiable sight, which cannot fail to impress one with the extreme need of greater care. The absence of literature, above all the relations which the Temporary Teeth bear to the normal eruption of the Permanent, and the thought that through an ill knowledge of this, irreparable harm is often done, must be my excuse for the following observations, culled mainly from chairside demonstrations at this Hospital.

Some short time ago, we were told by Mr. Black, in an able paper, how by the aid of mechanical means, the various irregularities of the teeth, when present, were to be treated; and shortly, I believe, we are again to be enlightened on this subject. I propose, therefore, to confine my attention to-night on how we may, given the intelligent help of the parents, and by our own careful treatment, preserve the child as far as possible from the not too fascinating, though ingenious contrivances, advocated by these gentlemen, and start him upon his career with a dental armature, which, advancing age and discretion giving him a due appreciation, he may by periodical visits to the operating room of the respectable dentist, retain to a ripened age. This includes a consideration of that most important period which intervenes between the eruption of the temporary teeth and the cutting of the second molar.

* A Paper read before the Students Society, Dental Hospital of London.

From the different aim to which our treatment is directed, my subject is naturally divided up into that of Temporary and Permanent. In the former, our object is retention until their absence is demanded by the advance of their successors and their removal should they persist after that period; in the latter, preservation during a trying period should be our aim.

The Temporary Teeth then, are not constructed upon the solid basis of their permanent successors, but their functions are quite as important and necessary. They contain a marked preponderance of organic matter, consistent with the length of service required, rendering them prone to early decay; their pulps are relatively much larger and, under the ravages of caries, become most easily irritated, exposed and inflamed.

The conditions under which they present themselves to us for treatment are—

1. For the correction of Irregularity of the Permanent.
2. For Caries.

The former generally occurs in the Incisor region, and occasionally a necrosed root of a molar; the latter in the coronal and interstitial cavities of the molars.

For treatment we rely on 1. Extraction; 2. Plugging.

Extraction should rarely be performed; it is a cruel operation for such tender age, and the consequent harm to the permanent, if performed at too early an age, can hardly be over-estimated. I conceive that this radical operation is justifiable only under the following circumstances:—

1. Where the time for the eruption of its successor having fully arrived, and we have assured ourselves that a permanent will come, when through insufficient absorption, it remains and diverts it from its normal position.

2. Where its persistence has already been the means of causing the rotation, or irregularity of position in or outside the arch.

3. In cases of acute abscess, threatening to burst externally, or causing a badly swollen face, or febrile disturbances.

4. Cases of Periosteal Cyst; this is so rare that it is doubtful whether I should mention it, had not a case very recently come under my care.

5. Where as a result of acute abscess, a portion of the apex, or the whole root itself, on account of absorption of the investing tissue pierces the gum and gives rise to ulceration of the cheek, often followed by cicatrices binding the cheek

to the gum. The operation is here best performed by placing an elevator above or below the apex, as the case may be, and, so to speak, lifting it out.

We often see, from some cause or other, that absorption does not take place at all—this being often the case in teeth which have lost their vitality—or that it does not occur perfectly, with the result that the successors are either checked in their eruption, or take up an abnormal position in the arch. Illustrations of this are frequently seen in the bicuspid and incisor region.

The removal of an incisor at any period, is of little consequence. With the canines and molars—and I wish to lay stress on the second molar especially—it is, however, different, for, in addition to the loss of masticating power, giving rise to impairment of digestion, we have the forward advance of the bicuspids and molars of the permanent set. Let us take an example, a not infrequent one, I fear, in our every day practice. We are tempted by the entreaties of the mother and the sufferings of the child to extract a second molar, and what is the result? The 6 year old takes its place, the bicuspids move forward and occupy the position subsequently intended for the canine, and this latter tooth will become erupted quite outside the arch; for appearance sake this will have to be extracted, and thus a characteristic tooth is lost, which well resists decay and affords a most substantial holdfast for any artificial work that may subsequently have to be inserted. It would be interesting to inquire into the cause of this forward advance of the teeth; the fact has been mentioned, but not accounted for. It has been suggested by some that they tend to follow the course of the blood vessels; but may it not rather be due to some sort of interstitial pressure, caused by the constant posterior addition of new bone on a space already occupied and of limited capabilities—so to speak, squeezing them forward.

I have said that a prolonged retention of a temporary may retard altogether or cause a malposition of its successor. A case which often perplexes us, is where a deciduous canine has been retained to an advanced period of existence, to the exclusion of the permanent. Are we to extract in the hope that the latter will take up its position, or are we to allow it to remain? In considering this question we have to bear in mind the relative worth of the two teeth, those recorded cases in which no permanent has appeared, the discredit

likely to be attached to us should this happen in our case. These cases are rare, but for treatment, I fall back on my original assertion, that we should only extract in those instances in which—from the condition of looseness of the temporary, the state of projection of the canine eminence, &c.—we are confidently assured that the non-erupted tooth will occupy its normal position.

Mr. Tomes says, "Regarding then the persistence of the temporary teeth as a cause which commonly operates unfavourably, not only by retarding the eruption of the permanent, but also by producing irregularities in the dental series, their removal must as a general rule be attended with advantage."

Thus then, we have to steer clear of the rocks of prolonged retention and premature extraction, and in attempting to escape from the Scylla of the one, it is only too easy to fall into the Charybdis of the other. The fear of falling into one particular evil leads us to fall into others. "*In vitium ducit culpæ fuga, si caret arte,*" as Horace said.

We now come to the conservative treatment of these deciduous teeth, and in addition to the fact that their early loss causes prominent canines, I would now like to add the following reasons for their preservation :

1. For the Health's sake. At this period of rapid growth, when so much depends upon the healthy nutrition of the body, their value of teeth for the proper preparation of food, for stomachs of limited digestibility, can hardly be over-estimated. A severe attack of toothache will cause also loss of appetite and all the evils consequent on a lowered vitality.

2. They probably by their presence afford a leverage, on which the tongue acts for the enlargement of the jaw.

In attempting, however, to carry out these preservative methods, we meet with many difficulties. Among them I may mention—

1. The Ignorance of Mothers. who with few exceptions, are endowed with the popular superstitions of domestic dentistry ; who regard the temporary teeth of only temporary, if any, importance, which may be extracted at any time with impunity ; who too often only solicit our interference when their own rest is disturbed. An erroneous idea in the minds of some that they are intended to be lost by decay, or like the shedding of a bird's feather. I say, that the care of the deciduous set ought to occupy more attention—on our part

as well as on the mother's,—that the first few years of a child's life are too often a time of neglect, and that the use of the tooth-brush is not sufficiently insisted upon. Buona-parto once asked Madame de Stael in what manner he could best promote the happiness of France. Her reply is full of political wisdom. She said, "Instruct the mothers of the French people." Similarly I would say, that we can best conduce to the welfare of our young patients, by impressing upon their parents the utmost necessity for care and supervision at this important period of life.

2. Tender age and nervousness of patients.—Undoubtedly this is a most serious drawback to the successful treatment of children's teeth; they try our patience by their restlessness, our tact by their shrewdness, our persuasive power to the utmost, and sometimes the suavity of our temper by the uncontrolled exhibition of their own, and it often requires great self-control on the part of the jaded operator to abstain from at once extracting the tooth and ridding himself of further trouble. To you, gentlemen, who receive your education at the Dental Hospital of London, and who, both from the example and precept of your teachers, cannot fail to be impressed with the dominant idea that gentleness as well as proficiency is the goal to be aimed at in the profession which you have chosen; to you who, like myself, believe that on the successful management of the children, eventually to be entrusted to our care, depends in a great measure our future success in private practice, for me to attempt to enumerate the especial qualifications of manner necessary, would not only be tedious but superfluous on my part. One golden rule, however, never under any circumstances to be departed from, I would insist upon. and that is, never to deceive the child, but by a winning and gentle manner get rid of his fear by gaining his confidence; try to amuse them and they will become good patients. The practice of concealing the forceps under the sleeve and in an unguarded moment performing an extraction is not yet obsolete. It is seldom necessary to use the engine, sharp excavators and an enamel chisel being all that is, in the majority of cases, necessary. The use of the Rubber Dam too should only on the best of patients be employed.

3. Inadvisability of using arsenic.—The feature of this idea is the great liability—if the tooth has undergone much absorption—of an escape of the drug, and a subsequent

necrosis of the spongy alveolar process as the result of its action.

Having then decided on the importance of filling the teeth and recognized the difficulties we have to encounter, it remains to consider the filling best suited, and means of employment best adapted for comfortable preservation during the few years that their function is necessary.

I propose to adapt my treatment to the state of the tooth Pulp and Periosteum.

I first take those cases, generally to be met with in interstitial and crown cavities of the molars, *in which the pulp is not involved*.

Amalgam.—Sullivan's, perhaps, being the best variety may be used effectually and with confidence, with a non conductor of osteo or carbolized paper if the cavity extends at all deeply. Great care is however necessary in excavating, as, owing to the relatively large size of the pulp, it is not uneasily exposed.

Not long ago Dr. Bonwill advocated treatment of interstitial cases by filling the intervening spaces as well as the cavities themselves with Gutta-Percha. If the crowns are not involved he opens the cavity through the buccal wall, but where the crown is implicated they are to be opened from above. The advocates of this practice—and I have been assured by men, who adapt this line of treatment, of most excellent results—claim for it the following advantages:—

- i. That it keeps the mouth healthy by preventing the lodgment of food between the teeth.
- ii. That it does not, as one would at first suppose probable, irritate the gums.

- iii. That it is very comfortable to the patient.

2. Taking next those cases where irritation has intervened, we must bear in mind the susceptibility possessed by a young pulp and not insert any filling which from any cause would continue the irritation. Gold should in no cases be dreamt of, and amalgam, unless with a non-conductor, from its rapid conductivity of thermal changes is excluded.

Gutta-percha, is not an advisable filling, on account of its liability, through its impressible and yielding nature, to irritate during the pressure of mastication. We *have*, then, left Osteo, and in my opinion this is the most serviceable for these cases. Easy of insertion, requiring little holdfast, non-irritant and non-conducting, and lasting sufficiently long for the purpose required, it offers exceptional advantages.

3. In cases of traumatic exposure. Capping may be advantageously resorted to, our only aim being a preservation of freedom from pain ; it being immaterial whether or no a formation of secondary dentine takes place provided that the tooth may be preserved until its loss is required by its successor.

4. Where inflammation of the pulp has supervened. We have two conflicting modes of treatment ; one is, to kill by means of an escharotic, and the other a preservative treatment. The danger, on account of the imperfection of the tooth structure, at an early age, through insufficient development, and at a later period through absorption, of applying arsenic, and the difficulty of cleansing the canals would lead us to incline to the latter treatment, of which many methods are in vogue. Here is one way : Over the exposed pulp put a layer of Iodoform mixed with Alcohol and Glycerine, cover this with a dressing of Benzoin and leave for 24 hours. If at the end of that period there is no pain, renew the Iodoform, cover it with Gutta-Percha Solution and subsequently flow over with Osteo. Another way, is to treat with a sedative, as oil of cloves or peppermint, place a large cap over the exposure and fill in with Osteo. Should the pulp die, as in all probability it would—the after pain, if any occurs, could be relieved by the performance of Rhyzodontrophy, the practice of which, though deprecated by some in the treatment of the permanent, is quite justifiable for the salvation of a temporary.

Should we decide to extirpate the pulp, a few dressings of carbolic or creosote are quite sufficient to kill.

In those cases in which much disintegration of tooth substance is accompanied by great pain, much permanent relief may be obtained by the insertion of dressings of Creosote and Gum Mastic in the proportion of 2 drachms to the ounce.

5. The Pulp being dead, the canals may be cleansed and plugged with Iodoform either on cotton wool or in conjunction with wax, or Rhyzodontrophy may be performed. A plan adopted by some is to grind, with a corundum stone, the tooth off flat with the gum level, but by this means the use of the tooth, for mastication is lost.

6. Taking next the sixth condition, that of Periostitis, I maintain that this is not a sufficient excuse for extraction. Astringents and counter irritants are both useful, but nothing

is so beneficial as a superficial scarification with the gum lancet.

But time passes on, and I must conclude this portion of my paper. If I have made myself sufficiently clear, you may have gathered that the dominant idea of treatment of these Deciduous Teeth, no matter by what means brought about, whether by capping or destruction, by extraction of pulp or Rhyzodontrophy, has been their preservation until the time of their displacement by the Permanent; and that when obviously causing retarded eruption or displacement of their successors their removal is attended with advantage.

I now come to the consideration of the Treatment of the Permanent Teeth, and I propose dealing with it under the following heads.

1. The fillings that should be employed.
2. The treatment of the 6 year molar.

With regard to the first, let me recall to your mind three facts. (1) That the pulp is considerably larger than at a later period when progressive calcification had taken place. (2) That the teeth harden with age, and (3) that the roots of the teeth are not completely formed until some considerable time after their eruption. Bearing these in mind it is easy to realize that any irritation set up by the conductivity of thermal changes through a metal filling would be likely to cause death of the pulp or abnormal performance of its function, and to gather that the use of a non-conductor is almost an absolute necessity.

Osteos and amalgams we know assist, or even cause a hardening of the tooth substance; gold does not, and from the impatience and nervousness of the patient it is extremely difficult to insert a perfect filling. Therefore I believe that the most conscientious treatment consists in using, for the front teeth, osteo alone, and for the back amalgam with a floor of osteo, for the first twelve or eighteen months with the subsequent insertion of a gold plug, when the tooth is hardened and the patient has learnt to regard your operating chair with less terror, is that best calculated to give relief to your patient and bring kudos to yourself. For sensitive dentine—a severe hindrance to the manipulation of the cases—Oil of cloves and Chloroform are perhaps the best obtunders; but to my mind drugs are only of secondary importance to sharp excavators, the use of good burrs and especially of the finely

cut finishing burrs, rapidly rotated but intermittently applied to the tooth.

2. The First Molar, from the great frequency with which it comes under our treatment, the sharp controversy to which it is invariably giving rise, and believing as I do that there is no subject connected with Dental Surgery of more practical importance or deserving of more attention and investigation, than its retention or removal, must now be considered. Let me first of all briefly review the arguments for and against these two diametrically opposed methods of treatment.

Considerations favouring Extraction :—

1. Its Predisposition to Decay. From reliable statistics it appears that out of 3000 teeth removed from various causes 1100, or more than one-third were first molars. Examined histologically, the cause, apart from and, to my mind, more apparent than its presence in the mouth during the early diseases of childhood—would be rendered evident, by the existence of marks of defective structure ; pits, fissures, and want of that full impregnation of lime salts which occurs in a perfect tooth, relegating it to a composition little better than that of a temporary tooth, which indeed, some people consider it to be.

Secondly, That it is the easiest and most desirable way, in a majority of cases, of treating the simpler forms of Irregularity, without the aid of mechanical means.

Thirdly, The promotion of a healthier state amongst the remaining teeth, and an increase in the facility of treating Caries when it presents itself.

This especially refers to Interstitial Caries, its great liability to infect the adjacent tooth, and extreme difficulty of successfully treating it.

Fourthly, The prevention of the great pain and distressing symptoms which frequently accompany the eruption of the wisdom teeth, and, by allowing of their forward motion in the mastication of food.

Fifthly, It is an acknowledged fact, that consequent upon and almost invariably coincident with the advance of civilization, is a reduced size of the maxilla, affording insufficient room for the teeth ; and it seems quite natural to relieve the crowding by extraction of that one of the series, so pathologically liable to decay.

Arguments in favour of their retention :—

1. That from its position and great size of the masticatory

surface, it is physiologically the most useful tooth in the head.

2. Its severity and apparent needlessness at the time of the operation.

3. That they are not invariably of bad structure.

4. The slowness of the results.

5. Occasionally the wisdom does not appear at all, or in a very stunted condition.

6. Its liability to cause "tipping" of the adjacent teeth.

Many practitioners, I believe, invariably extract these teeth; others can see no reason for their preference to the remainder of the series in this respect; but does not a consideration of the above conditions, for and against, lead us to the conclusion that it is impossible to lay down dogmatic rules, and that each case must be treated on its own merits. Some urge the practical impossibility of inserting a permanent filling; but with the view of a future gold crown, I do not think this need influence our treatment.

Myself, I am firmly convinced that it is good treatment in the great majority of cases to extract one of the teeth on each side of the arch, and I should have no hesitation in adopting a treatment of systematic removal of the 6 year olds where there was any tendency to overcrowding, but I should always give precedence to a carious tooth, and in no case extract a sound first molar when a bicuspid or posterior molar was decayed. Should we decide on their removal it must not be done at a sufficiently early period that the loss of masticating power will be felt, or so late that the perfect apposition of its adjoining teeth will not take place. They should never be extracted before the eruption of the bicuspids, just after that period being the best time, or after the 16th or 17th year.

A rule has been laid down, never to extract until all the teeth are through; but it seems to me that extraction of the first molars at the age of 12, would allow the second to come forward while underneath the gum, and prevent the tipping which has been alluded to.

In conclusion, Gentlemen, I wish to offer you an expression of gratitude for your patience in listening to what is, I fear, but an imperfect exposition of the subject, of hope that you will be unsparing in your criticism, and of confidence that you will supply its defects by an interesting and profitable discussion.

ROOT FILLING.*

By Mr. W. H. GILMOUR.

THE object of this paper is not to bring forward any new idea, but rather to bring together a few of the different materials now used and found to be successful. The practice of root filling has made great strides towards improvement and success of late years ; but even now some practitioners would rather extract these badly decayed grinders, than go to the greater trouble of treating and filling them. In private practice, when patients have teeth filled, which they themselves have given up as lost in regard to use, there is brought about a greater amount of confidence in the operator than in any other branch of Dental Surgery. To have such teeth filled, made comfortable and of greater use in mastication, must indeed be a great boon to the patients. The time taken and the number of dressings required are certainly drawbacks, still the result when successful quite counteracts these. The *modus operandi* of root filling may be altered to suit four classes of teeth :—

Firstly.—Those in which the pulp has been devitalized or extracted.

Secondly.—Teeth in which the pulp is already dead.

Thirdly.—Where they have formed abscesses.

Fourthly.—Those with abscesses in connection with which, there is a fistulous opening.

The first thing necessary for any of these classes is to remove all decay from the cavity, the pulp chamber should then be well opened and so much of the tooth filed away as will give free access to the nerve canals of each root. The next step is to remove any debris or remains of dead pulp tissue, and the canals to be dried thoroughly. To accomplish this, fine pointed instruments are required. Donaldson's pulp canal cleansers and nerve barbs are most useful for removing the larger particles. These may be assisted in manipulation by Donaldson's Holder. Bibulous paper or cotton wool wrapped round small watchmaker's broaches with the temper

* Paper read before the Student's Society of the Liverpool Dental Hospital.

lowered will effectually clear the smaller particles and at the same time dry the canals. After this has been done teeth of the first class, and sometimes second, may be successfully filled ; but if there is any pain caused from a small portion of nerve not having been properly devitalized, a small dressing of arsenic should be introduced on cotton wool or Bibulous paper into the canal. The cavity is then filled temporarily with guttapercha. The same method of cleansing and drying must be applied at the next sitting ; then, if perfectly painless and the canals dry, filled. In the second and third classes this is not always sufficient. The canals, being cleaned and dried as far as practicable, must be rendered antiseptic by one or more dressings. When the discharge of pus or any septic matter does not diminish, iodoform and eucalyptus oil, or even better, iodoform and vaseline, should be pumped into the root and a free drainage left through the temporary filling. In cases of more than one root a drain should be left for each root. A smooth Donaldson or small broach is passed into each root, with the ends coming through the cavity, then Waite's pink gutta percha packed round them. These are then withdrawn and leave an excellent drain. At the next sitting, after the canals have again been cleaned and dried, iodoform and vaseline on Bibulous paper should be left in each canal but no drains are required through the guttapercha. A period of about a week is allowed to elapse and then if there has been no pain, the roots may be filled. In the third class, the treatment described may have to be repeated on account of the pain experienced by the last dressing. The last class of teeth, though they may seem to be in a very unhealthy condition, are treated almost as simply as the first. The roots are cleaned and dried as far as possible, the same as in other classes, then iodoform and vaseline is pumped into them ; no drains need be left, the fistulous opening carrying away any discharge. The roots are again dried at the next sitting and may be filled.

Iodoform, though doubted as an antiseptic, certainly gives excellent results either alone or with any of the essential oils. Other antiseptics are used, bichloride of mercury being a very powerful one. Cotton wool is dipped into a solution of 1 in 1000, and the roots mopped out with it.

Creosote and carbolic acid have much the same qualities as antiseptics, also to subdue offensive odours.

Creolin, a new antiseptic and germicide, obtained from

English coal by dry distillation, is said to be ten times more efficient than carbolic acid. Of the essential oils, Eucalyptus is best, being an effective deodorizer and non-irritant antiseptic. Campho-phenique is claimed to be one of the best and most agreeable antiseptic for dental practice.

The materials now used for filling the roots are numerous. In cases where there is a tolerable certainty that no inflammation will follow, and no likelihood that the filling will ever want to be removed ; also providing the roots are accessible and of fair calibre, gold or tin is given in Tomes's "Dental Surgery," as the best material. The gold or tin is wound round a few fine broaches, one of them is taken and passed up to the apex of the root, the foil being slid off by rubbing it against the sides of the canal, then plugged by a blunt ended broach. Three or four of these prepared broaches, will be sufficient to plug the immediate apex, small strips are now introduced upon a blunt ended instrument, and plugged, will complete the filling. Fletcher's White Enamel or Zinc oxychloride mixed very thin and carried into the roots by small filaments of Bibulous paper or wool, which are allowed to remain there, will answer the same purpose as the gold, and is, I think, still the best root filling. A small piece of Bibulous paper, dipped into iodoform and vaseline, passed up to the apex of the root and allowed to remain there before the filling is introduced, will prevent any of the filling passing through the apical foramen, and also keep it in an antiseptic condition.

Another material is a solution of Gutta Percha in chloroform, which is pumped up the roots, and the chloroform allowed to evaporate as much as it will ; this is rather easily passed through the apex, which, of course, should be avoided in all cases. Gutta percha points are now extensively used with very good results; a little solution of gutta percha in chloroform is worked into the roots, the points are then passed up the roots as they are, and finished with a warmed instrument. Hickory is given in the May number of the *British Journal of Dental Science* as a root filling practised by Dr. White. He does not fill the whole of the root with this—only one-eighth of an inch at the apex ; the object being to effectually close the foramen ; the rest of the canal may be filled with anything desired. Paraffin, also iodoform and wax are used, but after the lapse of a few months the wax is soaked up by the dentine, leaving the canals empty,

so that it only forms a kind of temporary filling. Celluloid together with collodion, introduced by Charles S. Tomes, is the latest material used, for which he claims several advantages over any other.

As a concluding remark, I might say that there are some few cases which are not successful, a sudden bend in the root being the cause of this in most cases. After the roots have been filled, it is also, I think, advisable to allow a few days before, at any rate, an expensive filling is introduced into the cavity of the tooth proper. This time allowed will give one a chance of seeing whether the root filling is successful or not.

HYSTERICAL FACIAL PARALYSIS.

At a recent meeting of the Medical Society, M. Chantemesse presented three patients suffering from facial paralysis owning a hysterical origin. He remarked that these cases were extremely interesting, for although facial hemispasm was well recognised in hysteria, it was quite otherwise with facial paralysis, which was rare, and the true existence of which was, for many observers, sufficient ground for rejecting its hysterical origin. He submitted, however, that after examining the three examples which he exhibited, the members of the Society would have no hesitation as to their nature. It was nearly always the inferior division of the facial nerve which was involved, the orbicular division being left intact, as is usual in paralysis due to a central cause. The attack is in general seated indifferently on the left or right side, often, however, bilateral, with a predominance on one side. The appearance of the patient is characteristic, almost pathognomonic. On the affected side the sensibility of the pharynx and the conjunctiva is diminished; the same applies to the senses of smell, taste, hearing, and vision. Hysterical zones are, on the contrary, rare. The intelligence is blunted and the memory defective. The onset of the attack is usually sudden and the recovery gradual.

Lancet.

British Journal of Dental Science.

LONDON, NOVEMBER 15th, 1890.

DENTAL REPRESENTATION ON THE MEDICAL COUNCIL.

Mr. Morton Smale's letter, on the need of a dental representative on the Medical Council, has called forth a leader from the *Lancet*, which will be found elsewhere. Our readers know that we heartily endorse and support this project and, therefore, we warmly welcome this article; not because we agree with, nor, indeed, see the appositeness of the arguments, but because anything was better than seeing the idea still-born. Let us examine this leader, though we must admit it is difficult to do so with any degree of terseness, so contradictory are its sentences.

The text of the article may be taken to be that—"Specialities..... are best controlled by men who view special practice from the broader standpoints of medicine, surgery and midwifery." Now this is but a pious opinion, that we may hold or not, just as fits in with our views. We estimate the worth of such an opinion according to the value we may form of the speaker from other data. In this case, the only fact we have to go upon is that the writer immediately proceeds to say: "Of course, there are men eligible in point of law;.....they are medical practitioners *and* dentists." But does it not follow, *these would* "view special practice" from the broader standpoints of medicine, surgery and midwifery"? If so, would they not be the *very* men by whom specialities "are best controlled." We may, therefore, take it, from the *Lancet*, that dentists, having a medical qualification, are eminently fit men for the Council.

"If dentists are to be conceded a special representative, why not ophthalmic surgeons?" Exactly so,—why not? The answer is, they already have one in the person of Mr. R. Brudenell Carter, Ophthalmic Surgeon to St. George's Hospital.

"If a Midwives' Bill should pass, are we to be told then that the Midwives must have a seat in the Council?" Oh, yes! you will no doubt be told so, and you will be able to say—You have one in the person of Dr. William Leithman, and you had another in Dr. Matthews Duncan.

Nay, further, have not Specialists in mental diseases also already a representative in Dr. John Batty Tuke?

We are glad this objection is not pushed "into the region of the ridiculous," because when any one is given to doing so it is usually taken as evidence of the presence of moral mania, and we should be sorry to call in question the sanity of the leader writer. The fact is, it is neither a scientific nor a logical thing to meet any demand by dentists, for direct representation on the Council, by arguments of the *tu quoque* sort. There is certainly no other speciality of which there are 4,805 practitioners; which has a separate Act governing it; a separate register and registration fund. It is perfectly true many of these practitioners hold no diploma, but the days of the barber-surgeons are not so many years past as to allow invidious distinctions to be drawn. Such a numerous body have certainly a *prima facie* claim to representation. We do not wish to enter upon the question as to whether or no the Medical Council has or has not managed its dental business in a perfect manner; our claim for a seat is based on the same feelings and views which prompts this very writer to complain that "the direct representation of the (*medical*) profession is already too slight." It is the same idea which causes the *Lancet* to champion the claims of the Fellows and of the Members of the College of Surgeons to a fuller participation in the control of the College. It has been the origin of all representative institutions, and the argument, "particular hardship.....has not been alleged" has even been

advanced against their extension by those who believe, or are interested in, the preservation of the *statu quo*.

Specialism may be an "incompleteness," no one now-a-days would deny that "the whole is greater than a part"—but we do dispute that it is a "defect" at any rate in this world of imperfection. Who is not a specialist? The physician is one, if he is not a surgeon; the surgeon is one, if he is not a physician. Both are, if they are not at least equal in knowledge and experience to those who make the eye, the ear, the teeth, the skin or any other region their especial study. Nay, medicine itself is but a specialism of knowledge, and hence incomplete. If specialism be a defect, then the wisest physician of to-day is incomplete and imperfect, if we compare him with, say, an ancient Druid, who having all the knowledge possessed by the olden folk, must, on this view, be looked upon as more complete and with less defect.

The *Medical Press* is far more in accordance with common sense over this question than its contemporary. It says:—"In view of the fact that the Dental "Register" is compiled, and the Dentists' Act administered by the General Medical Council, it is a matter for surprise that provision was not made for the appointment of at least one member to represent the interests of this department of surgery—for such at present it may justly claim to be. It was certain that the lapsus would be recognised so soon as the dentists had acquired some coherence and *esprit de corps*, and a movement with this object on foot is now fairly under weigh. There may be technical difficulties in the road, but we do not suppose that the Council would be averse to a dental assessor, and no opposition is likely to come from any other source."

ALTHOUGH the case *Paterson versus Allen* was not one in which anything like a heavy fine was called for, and from this point of view, therefore, the verdict in favour of the plaintiff with a nominal fine, was all that we could desire, yet,

at the same time, we cannot but think that the Judge's remarks about "monopoly," were uncalled for. Surely, it is not "monopoly" to ask for an enforcement of the Law? We would ask, if an American barrister appeared in his Lordship's Court, would he allow him to take part in the case? No, not even if he were a very Portia. The two cases are on all fours, and "what is sauce for the goose is sauce for the gander." If it is monopoly in one case, it is in the other, and *vice versa*. Nor is there any hardship, especially in this case. Mr. Allen admittedly has lived in Edinburgh some time past. He must have known he could not practise there without another diploma; why then did he not take the L.D.S.E.? We may take this opportunity of pointing out that in following this line of argument, we do not wish to speak disparagingly of the New York College. We have simply to take the law as it stands, and according to this, graduates of this College are not qualified for registration here. If they feel aggrieved over this, it is for them to bring their case before the Medical Council. At the same time we may point out that their graduates are in no worse a position here than they are in many of their own States, even in the neighbouring one, New Jersey. In both cases, another Examination is required.

DENTISTS AND COCAINE.—We would not pretend to say whether or no the possession of the L.D.S. diploma would be held by the courts as conferring the right to administer cocaine but the following case from the *Lancet's* Paris correspondent is sufficient to show, that there are times when a medical qualification will stand a man in good stead. "It will be recollected," he writes, "that in a recent communication, I gave the particulars of a death which occurred in a dentist's practice in Lille, and which was attributed to cocaine poisoning, an injection of this alkaloid having been administered as a local anæsthetic previous to extraction. The circumstances, as I then mentioned, were being investigated by the legal authorities, which resulted in the dentist being indicted before the

local tribunal. He was charged, in legal phraseology, with "homicide by imprudence," but of this the tribunal acquitted him. The judgment sets out that the deceased, who was a young girl, succumbed to an attack of syncope, that it was not proved that the administration of a moderate dose of cocaine caused her death, but that this was more probably brought about by the shock of the operation itself in a highly nervous and anæmic subject. The dentist was, however, fined 15 fr. for practising medicine illegally, the Court holding to use the judge's words, "that practising, on the 8th of August last, injections of cocaine on the person of the deceased without being provided with a medical degree or diploma was in contravention of the law of the year XI. on the practice of medicine. Moreover, that cocaine is an anæsthetic of which the use necessitates great prudence, and the employment of which as such must therefore be restricted to legally qualified medical men, one of whom a dentist is bound to have present for the purpose of administering the said anæsthetic."

THE Berlin newspapers record the sad ending, by suicide, of a Freiherr Fritz von Tonop, who was trained in, and once practised Dental Surgery. He had been engaged in some heavy robberies and was wanted by the police; hence the suicide. He came of an old family living in Lippe-Detmold, to whose Prince he became in due course "Court Dentist. Unfortunately he lived over a Café chantant and so seems to have got into bad company. He apparently failed here, for we next find him travelling about the country alternately instructing dental mechanics and acting as billard marker, a few other occupations being thrown in by way of variety; briefly, his life was wasted. We do not know that there is much "moral" to be found in his story, unless it be—do not live over a Café chantant.

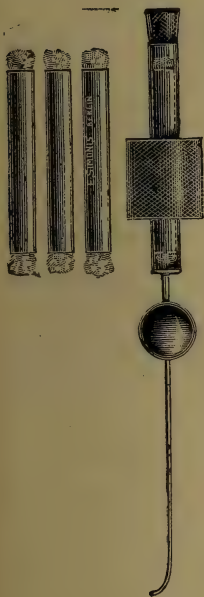
ATTENTION is just now being especially directed to Canada, and all of us wish it prosperity. We are glad to note that the *Dominion Dental Journal* has met with such success that it is proposed to publish it twice a month. We cannot quite understand this journal's complaint, however, because men to whom it was sent "kept it, but only seventy-six paid their subscriptions." If it is sent without being ordered members of the Profession can hardly be expected to go to the trouble of returning it, still less of paying for it.

THE two Acts regulating the practice of Dental Surgery respectively in British Columbia and the North-West Territories, which will be found on another page, are better than nothing, but are manifestly insufficient in many details. Thus the Acts do not apply to persons who have been in actual practice in the former case three months, in the latter one month. This is far too short a time, especially as "actual practice" is not defined. It is an open secret that at home many boys, who opened the door or swept the floor, managed to get "registered" equally with those who had practised many years. Then again, there is not sufficient distinction made between diplomas (especially foreign) which are registered. In the former case it is only insisted that "there was at the issuance of such diploma annually delivered a full course of lectures and instructions in dentistry or dental surgery." In the latter that it required "attendance at a regular course of lectures and an apprenticeship of not less than two and one-half years."

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

THE SENSITIVE DENTINE OBTUNDER.



The illustration will readily give an idea of the little apparatus which has been produced by Messrs. Simonis at the cost of a few shillings. One of the cylinders is lightly packed with cotton wool, and this is then moistened with absolute alcohol or some local anæsthetic. One end is then closed (though, by-the-by, the plug sent for this purpose is not very efficient) and the other end is slipped on to the end of the fine tube, as represented in the diagram. The block, which is shown over the cylinder, is of rubber to protect the fingers. All the joints having being tight, the ball is made hot in the flame of a spirit lamp. In a few moments a fine spray is projected from the tube, which is then allowed to play on the sensitive dentine. This was shown and demonstrated at the late Berlin Congress, its efficacy causing, it is said, considerable astonishment to the

members. It appears probable to us, that the effect is produced by dessication of the tooth substance. The tooth should, of course, be dried and protected from the access of moisture.

METAL SHIELDS FOR PAPER DISCS.

Messrs. Ash & Son send us some of the above shields. They have just newly produced them of exceedingly thin steel. This can be bent freely in any direction, but, having perfect elasticity, it always regains its shape. Being so thin, they may be said to require no more room between the teeth than the paper discs do. Being so pliable, they may readily be adapted by slight pressure to the form of the tooth, though still being stiff enough to support and protect the disc. Being so elastic, they always regain their shape and are ready for use in another case.

Abstracts of British & Foreign Journals.

"LANCET'S" LEADER.

WE publish elsewhere a letter advocating the claim of registered dentists to a representative in the General Medical Council. Mr. Morton Smale's letter is written in a moderate and reasonable spirit, and deserves consideration. His chief point is that when matters of dental interest arise there is no one of special knowledge who could be considered an authority in such matters, and the Council is without a guide. Such a proposition requires to be discussed not only with reference to itself, but to its bearings on the future composition of the Council. And we venture to say that, so discussed, it will not prove so obvious as might at first appear. But, first, let us see if any particular hardship has existed. If so, it has not been alleged. It is true that at the last meeting serious complaints from the dentists were received by the Council. But they were carefully examined, and, we believe, practically met. Mr. Smale himself allows that the profession is greatly indebted to the Council for its administrations of the Dentists' Act in the past. We do not doubt, that any representations made to the Council, as at present constituted, from the registered dentists will always meet with impartial and attentive consideration. So much for the proposition as it stands by itself; but if it be considered in what it implies, we feel the more need to be chary in accepting it.

I. If dentists are to be conceded a special representative why not ophthalmic surgeons? Indeed, it is clear that as an eye is more than a tooth, so the claim of the latter to special representation exceeds that of dentists.

II. If a Midwives' Bill should pass, are we to be told then that the midwives must have a seat in the Council? We shall not push this objection into the region of the ridiculous, but it might easily be so pressed. We have said enough to show that Mr. Smale's proposition is not to be accepted hastily. Specialism, it must be remembered, is a defect. It is an incompleteness. A dentist ministers only to a bit of the human body. It is not desirable to specialise in the General Medical Council. It would not even be good for dentists, whose best interests are served when they are kept up to full professional standards of knowledge and of conduct. The direct representation of the profession is already too slight to expect that the profession would give up one of its representatives to this speciality and another to that. Moreover, the law requires that direct representatives be registered medical practitioners. The only other source to which the dentists can look is the Crown. But its representation has been shorn already, and it is not very likely to initiate a representation of specialties which are best controlled by men who view special practice from the broader standpoints of medicine, surgery and midwifery. Of course, there are men on the Dental Register who are also on the Medical Register eligible in point of law, and equally so in point of breadth of knowledge and of training. But they cannot feel themselves unrepresented in the existing Council; they are medical practitioners and dentists. And the more of such the better.

Lancet.

A HUNDRED MILES FROM A DENTIST.

"WHEN I hear a man talk about dentistry," said Mr. Fuller, "I am reminded of my experience in Nevada.

"I had the toothache. I had it bad. It ached days and it ached nights, and it woke with me in the mornings. The miners did what they could for me. They tried to dig the tooth out with their jackknives, and pry it off, and what I suffered under their manipulation no man can tell. It was furious. One day they suggested that I put some acid in it.

that they used in testing rock, and I tried that, and it eased it for a few hours, when it began again with redoubled fury. If we had pincers we would have had it out, but I decided it no go, and I had to give in and look forward to tramping to Austin.

"On the morning of my leaving I found a man who was going up with a pair of cattle and a pair of wheels. I went along with him, sick and weak from lack of sleep. It was 150 miles to Austin.—five days and nights of travel. For five days and nights I suffered. I walked most of the time, rode some on the wheels; slept at night on the earth with a pile of sand scooped up for a pillow; had awful dreams; was exhausted by pain and worn to the bone. At last I struck Austin. Despairingly I hunted for a dentist. There was none. Finally I found a doctor who had an old pair of tooth-pincers. He set me down on a soap-box in a grocery store and he went for me; and, as it seemed to me, after two hours of agony he pulled that tooth from its socket and I rose for the first time in many days happy in relief. Since then I have never looked a dentist in the face without thanking God for their dispensation and that I am surrounded by them."

Lewiston Journal.

METHYL-VIOLET AS AN ANTISEPTIC.

Methyl-violet is recommended as an antiseptic agent by Professor Stilling (abstract in *Therapeutische Monatshefte*, 1890, p. 294). He considers also that it prevents and stops the formation of pus, and it is sold by Merck, of Darmstadt, under the name "pyoktaninum cæruleum"; this is, however, the same as ordinary pure methyl-violet, such as is used for staining micro-organisms. Pathogenic and other bacteria have, as is well known, a great affinity for aniline colours, and on being exposed to the action of the dyes are soon killed. A solution of 1 per 1,000 methyl-violet applied to the conjunctiva makes the membrane and the iris and sclerotic (but not the actual cornea), a blue colour, which disappears the next day. Solid methyl-violet applied in the same way causes superficial erosions of the cornea. Methyl-violet is practically non-poisonous; rabbits eat grammes of it without suffering. Very large doses introduced into the peritoneal cavity

cause death. Methyl-violet solutions (1 per 1,000) are recommended by Stilling for eye affections; in corneal ulcers, blepharitis, conjunctivitis, phlyctænulæ, they act very beneficially. In deeper inflammation of the eye, keratitis parenchymatosa and serous iritis, good results were also obtained. Stilling says that methyl-violet sterilises the pus of suppurating wounds and ulcers; he recommends injections for empyema, purulent peritonitis, typhoid, and dysentery. Surgical instruments may be washed with a 1 in 10,000 or 20,000 solution, and the wound after operation treated with a 1 in 2,000 or 5,000 solution. Methyl-violet gauze, wool, and silk are also prepared. Garré and Troje (*Munch. med. Wochenschrift*, No. 25, 1890) find methyl-violet is not poisonous when used in the treatment of disease. It has, however, no specific antipyrogenous action. Troje's experiments tend to show that a solution of 1 in 1,000 hinders the development of, but does not in twelve hours, with certainty, kill the cocci found in pus. Fessler, (*Ibid.*) says he obtained excellent results in head wounds, contused and incised, by the use of a 1 per 1,000 solution. The remedy reduces the swelling and redness around suppurating head wounds—a result explicable by its bacteria-killing powers. M. Bresgen (*Therap. Monatshefte*, 1890, Nos. 7 and 10) speaks highly of the value of methyl-violet in nasal affections. It is applied till the mucuous membrane in the locality which is being treated is of a deep blue colour. It is very beneficial in local suppurating areas in the nose, and as an application after cauterising with the galvano-cautery or chromic acid. After cauterisation, it greatly lessens the usual subsequent discomfort and discharge; there is, as a rule, less bleeding. After the application of the remedy in solution from 0.2 per cent. to 0.4 per cent., the nostril is plugged with methyl-violet wool for two hours. Methyl-violet, in nose affections, according to Bresgen, diminishes inflammation and suppuration, and relieves pain.

British Medical.

Reports of Societies.

STUDENTS' SOCIETY. THE DENTAL HOSPITAL OF LONDON.

Ordinary General Meeting, held Monday, October 13th, at 8 p.m. Mr. LEONARD MATHESON, *President*, in the Chair.

The minutes of the previous meeting were read and confirmed.

The following gentlemen were balloted for and elected members of the Society.

Messrs. Austin, Bulgin, Clarence, Castellotti, Hayward, Herschell, Hull, Miller, Price, Reed, Trott, Watson, and Wilton.

The following gentlemen were proposed for the membership of the Society.

Messrs. Farebrother, Hankey, Gillett, Gardner, Weston, Stevens, Morley, Tisdall, Danolds, Paros, Steele, Townend, Tomlinson, Rankin, Mordaunt, Moseley, Fouraker, Gabelle, Simmons, Sexton, Baker, Ashby, Miller, Fluton, Baley, Prideaux, Walker, Northcroft, Goodman, and Taylor.

This being the first meeting in the Medical year, the President addressed a few words of welcome to the members, especially those who were just joining the Society. To the latter he pointed out the great value of a Society like ours to its members. There was first, the actual knowledge gained, which was considerable, as one often obtained information at its meetings, which was of great use in the practical work of our professions, then the Society's meetings formed a training school for practising speaking in public, a power which, gained at our meetings, could be wielded in the future for the benefit of the Profession, beyond this our meetings helped to keep alive a feeling of good fellowship among the students at the Dental Hospital. For all these reasons he was pleased to see so many new members present, and hoped that the coming year might be a prosperous one for the Society.

On Casual Communications being called for, Mr. C. Schelling showed a key instrument and also one for extracting roots called a "Pelican," both having been constantly used by his own grandfather for over fifty years. The key on one occasion brought away five teeth instead of one.

Mr. Briault showed the model of the lower jaw of a man æt. 33. There was a space of half-an-inch between the bicusps on the right side. The patient recollected having a tooth removed from that region eighteen months before. This was probably a supernumerary tooth. There was nothing peculiar about the bite to account for the space. He also presented the following specimens he had collected from the Extracting Room of the Hospital:—

1. A lower molar with three roots, the posterior root being bifurcated. It was more usual to find the anterior root divided.

2. Two specimens of gemination of temporary teeth. One was very interesting, consisting of a canine and lateral, the latter being at a lower level than the former.

3. A supernumerary upper wisdom tooth. A model showing a central incisor with a very pronounced cingulum.

Mr. Harrison presented a lower canine tooth with bifurcated roots.

The President then called on Mr. W. May for his paper on the "Treatment of Children's Teeth." (See page 102I.)

The discussion was opened by Mr. J. P. Smith. He endorsed what had been said about extracting persistent temporary canines. He had recently seen a case where the temporary canines were still firmly in place, though the patient had reached middle life, and he considered that it would have been a mistake to have removed them in the hope that the permanent teeth would come into place. It was most important to impress on mothers to look after their children's teeth; and to see that they were brushed regularly. He did not agree with Mr. May that one could not use the engine when excavating children's teeth. He had found that many young people liked the engine, the "little busy Bee" being quite a favourite with them. He sometimes used arsenic in destroying the pulp for children, but he only used a small quantity and left it in a short time. He had found gutta percha a better filling than osteo in these cases as it was more durable. It was best not to attempt gold till the patient was 17 or 18 years old.

Mr. Schelling thought that Mr. May had made but scant allusion to the treatment of temporary teeth with abscesses. Mr. Schelling thought such teeth should always be extracted.

Mr. Bull had lately seen a case of a patient aged 18, whose temporary canines were still in place, and showed every sign

of continuing so for a long while. He agreed with Mr. Smith that it was best to leave them in position and not to extract them. He thought Mr. May was a little too elaborate in his preparations for stopping temporary teeth. It was quite possible to put in a good osteo without putting on the rubber dam even if the latter could be done.

Mr. J. F. Colyer did not think it advisable to use the rubber for children's teeth, he much preferred the saliva ejector. He spoke highly of a combination of creosote and mastic for temporary fillings, and also of Mr. Coleman's prescription for treating superficial caries. He advised the exercise of great care in extracting temporary molars, so as not to injure the developing teeth beneath. He also described a form of irregularity which required immediate treatment by extraction. This was where the cutting edges of the lateral incisors projected forward over the centrals. The deformity was due to the erupting canines pressing on the apices of the laterals. To remedy this the first bicuspid should be removed.

Mr. Preedy thought Mr. May had been too conservative in his treatment of temporary molars. He felt assured that extraction of all abscessed temporary teeth, and those with exposed pulps, would confer a greater benefit upon the sufferers than the lengthened process of treatment advocated by Mr. May. This was especially true in the case of Hospital patients.

In closing the discussion, Mr. Matheson pointed out the necessity of treating children carefully and tenderly, and never deceiving them. Sympathy was the great secret of success.

Mr. May then replied to the various speakers.

A vote of thanks was then accorded to Mr. May for his excellent paper, and to the gentlemen who had brought forward Casual Communications.

The President then announced that the next meeting would be on Nov. 10th, when Mr. Gardner would read a paper entitled "Capping Osteo Fillings."

The meeting then closed.

Review.

"A System of Oral Surgery," by Jas. E. Garretson, A.M., M.D., D.D.S. Fifth Edition, published by J. B. Lipincott & Co., Philadelphia, 1890. pp. 1364. Price 9 dols.

There is but little call for the reviewer in a book which has reached its fifth edition. It may be said to have passed its Rubicon, and to have taken its place amongst "accepted text-books." This book attempts the almost herculean feat of comprising in its pages most that a dental student needs in any department of study, both general and special. The writer's extensive experience in the general side of our work, in his capacity as Surgeon in charge of the Hospital of Oral Surgery, renders the chapters, in which he deals with questions concerning this, of much value. In the chapter on Odontomata, we find no reference to the recent papers of Mr. Bland Sutton, nor to the scientific classification of these abnormalities, which he there advocates. Then, again, in the chapter on Chloroform, it is stated that "In nearly, if not quite all the fatal cases resulting from its administration, cardiac syncope has been the cause of death" no mention being made of the view that "Respiratory failure" is held by many to be the cause. At all events there is no room for the author's dogmatic statement. In the chapter on Celluloid no reference is made to the unhappy results which have unhappily attended its use in the hands of most practitioners. A good idea is that of using celluloid as a gum facing for vulcanite pieces, this appears to us worthy of trial. The points mentioned, and many others, lead us to the conclusion that this edition hardly brings its matter sufficiently up to date. We would suggest that, in the next edition, the book should be divided into two volumes, the one treating of surgical diseases, the other of the more purely dental. Failing this, room should be gained for a fuller treatment of Dental subjects and Anæsthetics, by cutting out the chapters on the Anatomy of head and neck; for Dr. Garretson himself would hardly contend that the student should be absolutely ignorant of the anatomy of other parts of the body, which this book does not contain. If, then, he must study these subjects in a treatise on Anatomy, why cannot he there also study the head and neck? What, then, is the use of having it all recapitulated in a work on Oral Surgery? The book is well written, printed, and illustrated.

Dental News.

THE EDINBURGH DENTAL STUDENT'S SOCIETY.—The ensuing session of the above Society promises in every detail to be in no wise inferior to any of its predecessors. The papers, already on the programme, are mainly contributed by present students, and embrace such debatable subjects as "Cocaine," "Ought roots to be retained in the mouth?" "Is a Medical Qualification advantageous to a Dental Surgeon?" besides papers are promised on "Regulation Cases," and other no less interesting subjects not yet titularly announced. The committee announce, in addition to the Annual Dinner in March, an Annual Dance, to be held this session early in December.

THE DENTAL HOSPITAL OF LONDON.—The Annual Dinner of the Staff and Past and Present Students will be held on Saturday, November 29th, at the Holborn Restaurant, under the presidency of Dr. Joseph Walker, L.D.S. Gentlemen, either now or formerly connected with the Hospital or School, who may not, through inadvertence, have received special notice, and who desire to be present, are requested to communicate with the Dean, at the Dental Hospital, 40, Leicester Square.

THE NATIONAL DENTAL HOSPITAL AND COLLEGE will hold their Annual Dinner on Friday, November 21st, at the Holborn Restaurant. Dr. B. W. Richardson, F.R.S., will be in the chair. Tickets may be obtained of the Dean at the Hospital. The Prizes will be distributed to successful students during the evening.

DEATHS UNDER CHLOROFORM.—Following closely upon each other three deaths, during the administration, of chloroform for dental operations, have occurred in Edinburgh. The first fatality took place something like a month ago, the patient being a young married lady who died in her own residence, in the presence of two medical practitioners. Another case;

was that of a boy of thirteen, whom report has it, stood up after the operation, and immediately fell back and expired. The most recent fatality occurred, at the end of October, to a middle aged married woman, and this particular case being reported to the authorities found its way into the lay press. It is to be regretted, that the dental practitioners engaged have not seen their way to contribute an account of their own experience in the unfortunate results, and that the lay press have gained sufficient information to publish an alarmist account of the fatalities.

THE MELBOURNE DENTAL HOSPITAL.

THE Melbourne Dental Hospital was officially opened on the 12th September by Sir James MacBain, in the presence of a goodly and representative company. A capital light luncheon was provided by Mr. Skinner, the well-known caterer, as a contribution to the cause, and a number of toasts were proposed and responded to.

The building is situated in Lonsdale-street, opposite the Melbourne Hospital, and occupies the upper portion of the premises known as Garton's Horse Bazaar Rooms, which have been fitted up with the latest appliances, and will be open every morning from 11 till 1 o'clock. A staff consisting of six dentists has been appointed, one of whom will attend each day in turn. Students in dentistry will also be taken in the same way that they are in dental colleges in England, and this will be a very distinct gain to the dental profession, as by the Dental Act it is necessary for its members to possess certificates of competency in their work.

The institution is to be entirely free to the public, in the same way that similar institutions are at home. No fees of any kind will be required, but grateful patients may contribute to the funds at their pleasure.

Dr. Le Fevre, president of the institution, introduced Sir James MacBain to the assembly.

Sir James MacBain, who was received with applause, referred to the benefits which the institution would confer upon the poor. Its object ought to have the sympathy of every right-thinking person. He regretted the absence of certain members of the Government, who had intended to be present, but who were unavoidably prevented. At the same time, he hoped they would recognise the claims of the institution and

give it all the assistance they could. No doubt some people believed the ordinary medical profession occupied a higher grade than that of the dentist, but, for his own part, he felt that in the matter of health they were both equally important. He concluded by proposing success to the institution. (Hear, hear.) The new institution had embarked on a career of benevolence, which he hoped would result in great success. (Applause.)

LEGAL.

DISPUTE ABOUT A SET OF FALSE TEETH.—At the Liverpool County Court, before his Honour Judge Collier, Mr. Henry Stewart, dental surgeon, Rodney-street, sued Miss Ellen Lowe, of Sefton street, Southport, to recover the sum of £18 16s. for professional services, and a set of teeth supplied. It appeared that in November last, Miss Lowe had fourteen teeth extracted. for which Mr. Stewart charged a fee of £2 2s. In January following, he fitted her with a set of false teeth in gold, for which his charge was £12 12s. Miss Lowe retained possession of them for six weeks, and then complained that they did not fit properly, and that she had had an illness in consequence. Mr. Stewart, who stated that he had explained that some readjustment might be necessary through the shrinking of the gums, waited on Miss Lowe at Southport, and offered to supply a temporary vulcanite set until the original set should be wearable. After some delay this offer was accepted, and the defendant paid the cost of the vulcanite set in court. The question for the court to decide was whether the plaintiff had fulfilled his contract with regard to the first set.—Evidence in support of his claim was given by Messrs. Raymond and Alexander, surgeon dentists.—The case for the defendant was that the original set did not fit at all, and that she had suffered a severe illness through attempting to wear them.—His Honour held that the plaintiff had fulfilled his contract in regard to the first set, and gave judgment for the plaintiff with costs.—Mr. Horridge (instructed by Mr. Pride) was for the plaintiff, and Mr. Rudd for the defendant.

CONTRAVENTION OF THE DENTISTS' ACT.—At the instance of William Broomfield Paterson, honorary secretary of the British Dental Association, a complaint was presented in the

Edinburgh Sheriff Court recently against Dr. Squire Winfield Allen, 40 Queen Street, who was alleged to have contravened the Dentists Act, 1878, by using on the brass plate on his door the words "Dr. Squire Winfield Allen, graduate of New York Dental College, formerly with Dr. Hogue," and by being entered in the Post Office Directory as an American dentist and a doctor of dental surgery.

A discussion on the relevancy of the complaint took place before Sheriff Rutherford about three weeks ago, when Mr. Wallace, appeared for the plaintiff, and Mr. C. S. Dickinson, for the defendant.

His Lordship, who then reserved judgment, held, on the case being again called, that the complaint was relevant.

Mr. Wallace, however, was allowed to make an amendment on it, the result of which would be, the Sheriff had remarked, to make it clearer. The respondent then pleaded not guilty, and evidence was called.

Mr. Gordon admitted that the plate was put on the door with the knowledge of the respondent.

After hearing Mr. Wallace and Mr. Gordon on the evidence, the Sheriff said it had been elicited that American dentistry was very well known in this country, and that Americans had made great progress in scientific dentistry and professed very great qualifications, and, therefore, he could not be under any doubt that when a person designated himself on his door-plate or anywhere else as a graduate of New York Dental College, and also when he said that he was formerly with Dr. Hogue, a well-known dentist in Edinburgh, he was claiming that he was qualified as being well skilled in the art of dentistry. His Lordship had no hesitation in holding the first charge proven. As to the second charge, he could not doubt that the respondent's American qualifications were set forth in the Directory on his instruction or with his knowledge. The only American qualifications recognized by the Act of 1878 were those of Harvard and Michigan Universities. At the same time, it was impossible not to be aware that a doctor of dental surgery of New York had a high qualification. While his Lordship found both charges proven, he had to keep in mind that the respondent seemed for a considerable number of years to have had a partner who was a registered practitioner under the statute; and as long as he had that partner the Dental Association could not get at him to prosecute him. That partner left him at Whitsunday last, and it did not seem that

since Whitsunday any intimation was given to the respondent that a complaint would be brought against him. It would have been well if the complainer had sent him information that he would be prosecuted if he did not either qualify in the manner required by the Act, or get a qualified partner. The first intimation he got, however, was the complaint which was suggested to be brought in the public interest. If they had found an ignorant man setting himself up to be a specially qualified dentist, there might be some ground for that observation ; but it seemed that the respondent had certainly very special qualifications for dentistry, and his Lordship did not see that the public required in any way to be protected against him. The complaint had evidently been brought because those gentlemen who were registered practitioners considered that the respondent had infringed their monopoly. In the circumstances, the Sheriff inflicted a nominal fine of 10s. Mr. Wallace did not press for expenses.

APPOINTMENT.

Mr. Stanley Read has been appointed House-Surgeon to the National Dental Hospital.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

GLASS INLAYS.

To the Editor of the "British Journal of Dental Science."
November 7, 1890.

DEAR SIR,—In answer to Mr. Braun's correspondence in your Journal, I must state that he is labouring under a great mistake, when he draws a comparison between my mass for making glass-inlays, and the low fusing body for making continuous gum work. I never asserted that my mass could be used instead of continuous gum, it has nothing whatever to do with it, but merely to make glass inlays for teeth cavities, and for this purpose it fully recommends itself.

In regard to the Venetian glass and the low fusing point, Mr. Braun is also mistaken ; that is where one of my improvements come in.

The mass Dr. Herbst and some others introduced to the profession is made

entirely of Venetian glass, transparency and cracking of the block was the result, even after having been inserted sometime in the mouth, (lately they took crushed Venetian beads to overcome the transparency, but the cracking of the blocks remained), this never happens with my mass when melted correctly; in regard to this point I asked the manufacturer, Mr. Simonis, and he told me that he has sold thousands of portions already, and never had any complaints, only letters of praise, and orders for other different colours. My mass does not at all melt so very easily, only Mr. Braun is not well informed on the physics of the alcohol flame, otherwise he would know what an immense amount of heat exists in such a flame. In the point of an alcohol flame he is not only able to melt 24 carat gold easily, (which means nothing else than 1102° Celsius), but also to frit Allen's enamel for continuous gum work, and this without the use of a blow pipe. In regard to the fading of the colour, I can tell him that in the course of some years I saw no change, which induces me to believe that the colour will be as durable as that of artificial teeth, and the same rule holds good as to the dissolving of the blocks.

I advise Mr. Braun to buy a portion of the mass as quickly as possible, and give it a good and thorough trial, and I am sure he will be as thankful to me, as his patients will afterwards be to him.

In regard to Mr. Walker's correspondence, I have to thank him for his compliments, as far as I can conscientiously accept them for myself, but he is in error to take me for the inventor of glass inlays. Dr. Land, of Detroit, and Dr. Herbst, of Bremen, claim also the right of inventorship, but none of us have any right to the claim. The man to whom the profession owes its thanks is Dr. C. W. Spaulding, U.S.A., who demonstrated glass fillings in 1877. But all failed in consequence of the transparency and cracking of the glass material.

This is where my part of the merit comes in, I claim to have found a process to produce a better material, and of somewhat simplifying the means of using it.

I might here observe that the blocks must be slowly warmed in the lower part of the flame, (alcohol not spirit flame), and then for fusing held entirely in the point of the same, *the block must be withdrawn as soon as a gloss appears on the surface*, otherwise it will be overheated, and be as liable to crack as overheated continuous gum enamel; for the same reason, I do not recommend the use of a blow-pipe.

Yours very truly,

ROBERT RICHTER, D.D.S.

Victoria Street, 25. Berlin, Germany.

TRESPASSING DENTAL TITLES.

To the "Editor of the British Journal of Dental Science."

SIR,—Kindly allow me space to thank your correspondent "Surgeon" on my own behalf, (and I am sure on behalf of the majority of Licentiates), for the able and timely warning respecting the growing and despicable adoption of assumed or fictitious titles which can but be regarded as a direct trespass.

and determined means of misleading the Public, and injuring the legally qualified Practitioner. I have pleasure in giving my entire support to each of "Surgeon's" remarks, and feel certain that the same will be re-echoed by all right minded persons. I would further say that "Surgeon's" impromptu and pertinent remarks, though late in the day, come with double force and seriousness, as they betoken no motive of jealousy, but a righteous intent to urge on a necessary check and attraction. I will just add, that from a derogatory point, in my own town we are infested with the disgraceful advertisements, photographs, etc., that "Surgeon" quotes, and appended to them in large letters is "*R.D.S.*" so what respect can we expect to find paid us, who are naturally coupled with these Bogus professors, whose assumed titles are so misleading? But, alas! no doubt the advertisements catch the empty headed.

I remain, yours faithfully,

W. H. KIRTON, L.D.S.I.

Hon. Dent. Surg., Royal Portsmouth, Portsea, and Gosport Hospital, &c.

To the Editor of "The British Journal of Dental Science."

12, George Street, Hanover Square, W.

Nov. 6th, 1890.

DEAR SIR,—In the year 1877 the late Mr. Alfred Hill, published through Messrs. Trübner & Co. a history of Dental Reform, embracing the principal events of the twenty years prior to that date. Since the death of the Author, Messrs. Trübner have generously placed the remaining vols. in stock at the disposal of Mrs. Hill. Messrs. Ash, and the Dental Manufacturing Company have undertaken to distribute these vols. free of charge to the widow, and copies may be had on application price, 5/-, just one-half of the publishing price. I sincerely hope that all who wish to have at hand a record of the progress of our profession during twenty eventful years of its history will secure to themselves this interesting work which in all likelihood will soon be out of print.

Yours truly,

J. S. TURNER.

ANSWERS TO CORRESPONDENTS.

Mr. William Lee, L.D.S. We do not quite gather what you require. All information is given in our "Students' Number," issued September, 15th, 1890.

L.D.S.—No notice is taken of anonymous letters; name and address should always be given, but not necessarily for publication.

NOTES ON METHODS OF INTRODUCING GOLD FILLINGS.

By JAMES F. COLYER, L.R.C.P. ; M.R.C.S. ; L.D.S. ;
Demonstrator Dent. Hosp. of London, and Assistant Dental
Surgeon to Charing Cross Hospital.

(Continued from page 1020.)

ii. *Non-Cohesive Method.*

For this method, as with cohesive, the gold is prepared either in sheets or as cylinders. The sheet is usually introduced in one of three forms, i.e., (1) Tape or Ribbon ; (2) Rope ; or (3) Stars or Stripes.

Whichever method, however, is selected, one golden rule holds true, that the folds of sheets or cylinders must be placed parallel to the walls of the cavity.

(a) *Sheet.*

(1) *Tape Method.*—In using the tape method, cut perhaps, a sheet of No. 4 foil in three pieces, and fold each of these with the foil knife until their breadth is about equal to that of the cavity. Next, take the strip up by the conveying forceps in the left hand and convey it to the cavity, and with a suitable instrument in the right hand press it down into folds parallel with the walls, each fold being left projecting slightly above the orifice of the cavity. When a few folds are arranged, they should be firmly compressed against the side of the cavity—useful instruments for this being shown in Fig. 37.

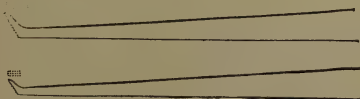


Fig. 37. Longitudinal Serrations only.

While for making the folds, those shown in Fig. 38 will be found best.

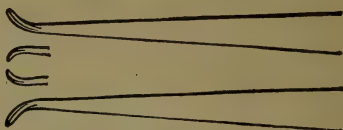


Fig. 38. Bing's Nos. 11 & 12.

When one length of tape is exhausted, another is introduced, and so on until the cavity is as full as possible.

The filling is then thoroughly condensed by suitable instruments—that shown in Fig. 39 being used for upper teeth, and that in Fig. 40 for lower teeth.



Fig. 39.



Fig. 40.

This step completed the surface should be tested by endeavouring to force into the gold an instrument of wedge shape, Fig. 41.



Fig. 41.

This instrument is practically "riggled in," by moving in a lateral direction; the hole made is then filled up with tape or very small cylinders. This process (viz., forcing in the wedge-shaped instrument), is continued until it requiresome considerable force to introduce the plugger into any part of the filling.

The surface of the plug is now thoroughly burnished with either a hand or engine burnisher (Fig. 42). This latter instrument is extremely useful, and trimmed down in exactly the same manner as recommended under cohesive, with the exception that after the use of the pumice, the burnisher is applied to the surface, and especially the edges.

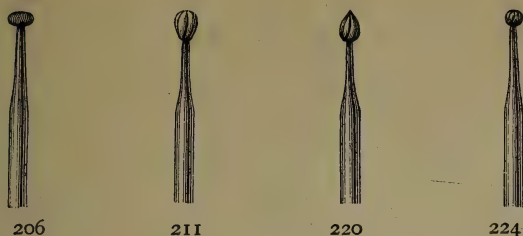


Fig. 42. Engine Burnishers (smooth or corrugated.)

(2) *Rope Method*. In this method the sheet, instead of being folded in strips, is rolled into a form resembling rope. There is practically no difference in the way of introducing it to that just described.

(3) *Stars or Strips*. In this process the sheet is folded into broad strips of about a half to three-quarters of an inch in breadth, and then cut at right angles into narrow strips.

These are then arranged as shown in Fig. 43, and inserted with the central portion downwards into the cavity. The projecting ends being folded downwards and inwards, and



Fig. 43.

compressed. Fresh portions are added in like manner until the cavity is full, the plug being finished in the usual way.

This process is useful for small deep cavities, and also for introducing the finishing portions into larger fillings.

(b) *Cylinders*.

Cylinders are, however, the most convenient form for introducing non-cohesive gold, and one of the most serviceable are those known as Ash's Non-cohesive, Style C.



This form of non-cohesive is introduced as follows :—

Take three, four, or more (the number depending upon

the breadth of the cavity) between the blades of the conveying forceps, and compressing them laterally, place them in position towards the posterior part of the cavity (Fig. 45) holding them in place with an instrument in the left hand, condense them first on one side then on the other, and finally in the centre. In this way continue to introduce and condense



Fig. 44, cavity ready for filling.



Fig. 45.



Fig. 46.



Fig. 47.



Fig. 48.

Representing various stages in filling.

fresh rows of cylinders until the cavity is a little over two-thirds full (Fig. 46). A different mode must now be adopted, the cylinders should be placed round the side of that part of the cavity which is still unfilled and condensed by wedging from the centre (Fig. 47), the last portion of the filling being introduced in the form of tape. The surface is now condensed, and the plug treated in exactly the same way as described under the tape method.

Very often it will be found difficult to get the row of cylinders first introduced steady when condensing, if, however, they are simply placed in position, and a second or even third row added before commencing condensing, the difficulty will be overcome.

Non-cohesive gold can be most advantageously employed in crown cavities, and on the cervical edge of interstitial ones in combination with cohesive. The advantages claimed for non-cohesive gold are that it adapts itself better to the walls

of the cavity than cohesive, and also that it is quicker to work, a point of great importance in practise.

iii. *Combination of Cohesive and Non-Cohesive Methods.*

The combination of cohesive and non-cohesive, is a very favourite plan with many operators. Cavities in approximal surfaces of bicusps and molars, are those usually filled by this method. The mode of procedure being as follows :—

Take two or three non-cohesive cylinders according to the breadth of the cavity, and place them along the cervical floor, so that the ends project outwards, not downwards. Gently condense these with the idea of getting them steady, and add another row, condensing again, first on one side, then on the other, and finally in the middle, since by these means you are not so liable to make the gold tilt.

This proceeding is continued until the cavity is about half full, Fig. 49 when the cohesive gold is started by wedging up a large uncondensed cohesive cylinder, Fig. 50 and to this latter tape is attached, and the filling completed as described under the cohesive method, the plug being finished in the usual way.



Fig. 49, shows non-cohesive cylinders in position, Stage 1.

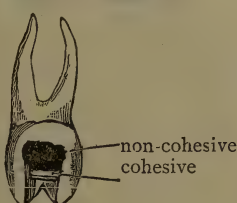


Fig. 50, shows cohesive cylinder wedged into position.



Fig. 51, shows cavity completed.

The advantage claimed by advocates of this method is that a better joint at the cervical edge is obtained than with cohesive, whilst those who oppose this method maintain that the non-cohesive gold is forced out by the power of mastication and forms a ledge for the lodgement of food, &c., at the cervical edge.

When the combination method is used for filling molars the floor, walls of the cavity and edges, are filled with non-cohesive the centre of the plug being completed with cohesive.

The idea being that non-cohesive adapts itself better to the walls of the cavity than cohesive, while on the other hand,

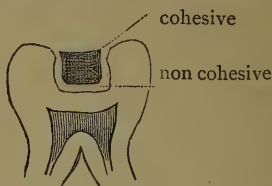


Fig. 52. Shows combination filling in a crown cavity.

the latter allows the filling to withstand mastication better than non-cohesive.

iv. *Gold in combination with other Metals.*

Gold and Tin.—This method has many ardent advocates who claim that it is comparatively easy to make water tight fillings with this combination, and still more that it has a preservative action on the tooth substance. The great disadvantage is that it turns black, and on front teeth is naturally unsightly.

There are two principal ways in which we can use it, viz.

1. Exactly the same way as when using a combination of cohesive and non-cohesive (the tin taking the place of the latter).

(2) By intermixing it with the gold as follows: One sheet of tin being placed between two of non-cohesive and the whole folded up with either tape or rope. The material being introduced into the cavity as recommended under the non-cohesive methods. A peculiarity of this latter method is not only that it works extremely softly, but that after a time some chemical action seems to take place so that the surface becomes quite hard and gritty.

The colours of the filling is however by no means of a pleasing character.

Gold and Amalgam. This combination is extremely useful in those cases where the cervical edge is below the gum, as for instance in the buccal cavities of molars, and interstitials where the cervical edge is high up and difficult to get at.

The combination is used in two ways,—

(1) By filling on the first visit the part of the cavity where the amalgam is to be used in the ordinary way, putting

some soft G. P. or cotton wool and mastic into the remaining part, and on the second visit trimming down the amalgam, and filling the remaining portion with gold.

(2) By filling the part required with amalgam, taking off as far as possible all excess of mercury, and then starting the gold direct on the top of the soft amalgam, the first two or three pieces apparently disappear, but the gold soon takes up the residual mercury, and resumes its normal colour, when this is the case the filling is completed exactly like a simple cohesive gold filling.

Some agree that electrical action is set up by the combination of gold and amalgam, but it is in all probability more theory than practice, the first method is a favourite one of mine, and I have never yet found a patient complain of any such kind of action.

Gold and Platina.—In this method the leaves of platina are gilded and made adhesive, and then worked in parallel layers. Great care is required to thoroughly anneal the strips and also preserve the parallelism, since if this is not done when the filling is completed patches of gold will show on the surface.

The diagrams with which I have endeavoured to illustrate parts of the text have been drawn for me by Mr. Phillips and to him I must express my gratitude for his skill and kindness.

The other cuts of instruments &c., have been very kindly lent by Messrs. Ash & Sons.

TO MELT PLATINUM.—Take a piece of charcoal and make a small cup-shaped cavity in it. Make a like cavity in another piece of charcoal, but cut a shallow groove leading out from the cavity. Place in the first cup three pennyweights of platinum scraps or teeth-pins. Cover them with the second piece of coal, so placed that its cup shall be over the other cup. Attach a tube from a nitrous oxide gas cylinder to the mouth-piece of a Melotte blowpipe, and direct the compound gas flame through the groove in the charcoal on to the platinum. When this is at the point of fusion, put it quickly under the blows of a hammer to condense the mass. Repeat this process until the piece is suitably shaped, and then pass it through the rolls for use.—Geo. W. MELOTTE. *Cosmos.*

ON ANÆSTHETICS.*

By HENRY DAVIS, M.R.C.S.Teacher and Administrator of Anæsthetics, to St. Mary's
and the National Dental Hospitals.

Mr. President, and Gentlemen,—This evening I intend to ask your attention to that which has been described as in one sense “the greatest operation in surgery,” viz., the production of anæsthesia, in order to afford mankind an escape from pain. As far as I am aware this subject has not been discussed in this Society for many years.

It is not my intention to consider anæsthetic agents in general, but merely to draw attention to some conclusions which have recently been presented to the profession in regard to chloroform.

Blest, as suffering mankind really is, in the possession of volatile fluids, the inhalation of which will induce such a condition as to enable the most painful operations to be performed without the patient being in any way conscious of it, we are not yet in possession of a perfect anæsthetic, far from it. By a perfect anæsthetic, I mean a substance which will paralyse all the sensory and motor nerve trunks without interfering with functions necessary to the life of the individual. That some such substance will be discovered we may continue to hope, and such facts as the paralysis of motorial end-plates in muscles by curare, the local action of cocaine on sensory nerves, and similar facts point in the right direction and should make us hopeful.

Pending this happy discovery we must be content with the agents we have in our possession, imperfect as they are. For instance, what a boon it would be if some anæsthetic were discovered, as suitable for the purposes of the general surgeon as ether and chloroform, which did not cause vomiting as an after effect; a trifling defect you may say but certainly one of great discomfort and inconvenience, and sometimes of actual danger to the individual. Even the discovery of a drug which would neutralise the effects of the anæsthetic in this direction would be a blessing. The vomiting of course was a grave disadvantage in some of the more

* A Paper read before The Harveian Society, on Nov. 6th, 1890.

delicate procedures of the ophthalmologists, but it has been largely banished by the discovery of the local anæsthetic action of cocaine.

Some may be inclined to think that in ether and chloroform we have two almost perfect agents for the purposes of general surgery, and that a mortality of about 1 in 2,000 for chloroform and 1 in 20,000 for ether is relatively so small that it is scarcely worth consideration. Take for example, nitrous oxide, this is the nearest approach to a perfect anæsthetic yet discovered, in so far as safety to life is concerned. Dr. H. C. Wood, of Philadelphia, has made an interesting calculation to the effect that "anæsthesia by nitrous oxide gas is probably effected in three quarters of a million cases annually in the United States. Most of these inhalations have been given not by trained physicians but by comparatively untrained and often very ignorant dentists : have been given to patients in a sitting or semi-sitting posture ; have been given without thought or care to the general community as the units presented themselves ; to the healthy and to the diseased alike, and the result is out of many millions of inhalations only three deaths have been recorded as directly due to nitrous oxide." He pertinently asks, "could anything be safer?"

The contrast between this and the results of chloroform are appalling. To-day for the purposes of general surgery the fight for supremacy lies between ether and chloroform. When compared, each possesses certain advantages over the other. The greatest disadvantage is that both may cause death by affecting the respiration and circulation.

It is generally accepted that ether in small doses stimulates the circulation, in very large doses it depresses the heart ; but it depresses the respiration more than the circulation, and in fatal cases death is due to primary arrest of the respiration. With regard to chloroform, clinical evidence tends to show that the circulation is primarily arrested. In some cases the respiration and circulation stop simultaneously and occasionally respiration is the first to cease.

Of late years attention has been acutely directed to the comparative safety of ether over chloroform and indeed one Medical Journal has gone so far as to assert that "deaths from chloroform are preventable and that with due care they may be avoided," this would seem to be the case when Sir Joseph Lister in his well known article on "Anæsthetics." in "Holmes system of Surgery" states that Mr. Syme had given

chloroform in 5,000 cases without a fatal result, and between the years 1861 and 1870 he believed that no death from chloroform had occurred in the operating theatre either of the Edinburgh or Glasgow Infirmary, two of the largest surgical hospitals in Great Britain, and in these institutions the chloroform is administered by the junior officers and students of the hospital.

Such facts as these naturally caused chloroform to be regarded by the Scotch surgeons as a safe anæsthetic, and they cling to this opinion with characteristic tenacity.

Whilst Scotland has been contending for chloroform, our American brethren have been urging the greater safety of ether; and in the United States so strong is the feeling in favour of this agent that as Dr. Wood expresses it, there is a tendency to conceal lethal cases from chloroform because the surgeon who uses it knows that if death occur from the anæsthetic a very large proportion of the profession will condemn him either in public or in secret for the use of this drug, and that he will be fortunate if he escape being publicly condemned by a coroner's jury.

In England the splendid reports from Scotland caused surgeons to adopt, almost exclusively, chloroform. Gradually as the method for administering ether became improved, this agent began to find such favour in England that it has, especially in London, been adopted as the routine anæsthetic by nearly all those who practise as specialists in this department, and it is rapidly replacing chloroform on account of its greater safety. Yet in spite of this, fatal results from chloroform inhalation are alarmingly frequent as judged from the reports which find their way into the papers, and we may be quite sure that in this metropolis as well as in the United States, all the fatal cases are not reported.

Now I feel sure that unless we utter timely warnings the rate of mortality from chloroform will increase, if the recently promulgated conclusions of the Hyderabad commission, relative to the action of chloroform on Pariah dogs be adopted in regard to human beings.

I need not occupy your time by recapitulating the circumstances which led to the institution of that commission, as they are so recent and so important that it excited the universal attention of the profession, and indeed the public at large; and we are all deeply grateful to those whose munificence

rendered it possible, and to the able commissioners who executed it.

The most important outcome of that Commission, and one which is undeniable, is that when Pariah dogs are fatally chloroformed respiration ceases before the circulation, that is, *the heart continues to beat for a brief but variable period after the breathing has ceased*. When this is interpreted, it means that in administering chloroform to human beings we need pay little or no attention to the pulse, but attentively watch the respiration for signs of impending danger.

We must not go beyond this ; admitting that chloroform kills by paralysing respiration, whereas heretofore it had been regarded as a cardiac paralyrant, this fact in no way increases its safety. Chloroform is admitted by all, even by the commissioners, as a very powerful drug, and that it is more powerful than ether is proved by the fact that according to statistics obtained from published cases, as already mentioned, the mortality from chloroform is nearly ten times greater than ether.

To my mind it signifies little so far as choice of drug is concerned whether chloroform kills by paralysing respiration or circulation first ; the question is, which drug is more likely to produce a fatal effect. At any rate, the plan upon which I work is, to select ether for a patient (supposing chloroform and ether to be equally suitable for the purposes of the surgeon) as the safer anæsthetic ; and I believe the best method to adopt is to select our cases and not blindly use one drug to the exclusion of the other. It is the same in surgery, Syme's amputation in a young subject is a good procedure, in an old woman of 80, it would not be judicious.

Without entering into the scientific aspect of the conclusions arrived at by the Hyderabad Commissioners, it seems to me that one of the results which will follow the propagation of their report is that chloroform will be used more and more as a routine agent, and that deaths will become more frequent. As a set off against this I may point out that in London at least, the relative safety of ether as compared with chloroform is so well recognized that with many of us there is no fear of chloroform usurping ether, for the question of their relative safety receives to my mind the strongest answer possible in the fact that every skilled anæsthetist of my acquaintance invariably selects ether, as his routine agent ; and this choice has been recently confirmed on its scientific side in a very

remarkable manner :—Since the publication of the report of the Hyderabad Commissioners, Dr. MacWilliam of Aberdeen has made public his report* “ *On an experimental investigation of the action of chloroform and ether.*”

In this investigation the most important results were obtained on cats. The mode of conducting the experiments was extremely ingenious, and successful graphic representations of the effects of the anæsthetic upon the heart were obtained.

The evidence furnished by these experiments must be received with caution, because portions of the thoracic walls were removed, the pericardium opened and the recording apparatus brought into direct contact with the heart. Under such conditions, respiration had to be maintained artificially.

In the course of the experiments Dr. MacWilliam had several opportunities of witnessing the phenomenon known as cardiac delirium on the cat's heart from the influence of chloroform. In this curious condition, the normal beat becomes abolished, and the ventricles are thrown into “wildly irregular, inco-ordinated ineffective action.”

This effect only occurred when an overdose of strong chloroform vapour was pumped into the lung.

We have no evidence that chloroform ever produces this condition in man, but as MacWilliam suggests, it is possible that in hearts depressed and dilated by chloroform this peculiar delirium cordis may occur and cause death.

One of the most interesting conclusions arrived at in this investigation is that relating to the dilatation of the cavities of the heart due to the direct effects of chloroform upon the cardiac mechanism, and not due to the action upon the vagi, and that cardiac failure occurs by a more or less sudden enfeeblement and dilatation of the organ, and not by a sudden complete cessation of rhythm.

Dr. McWilliam also observed that the free dilution of chloroform with air, the restriction of the percentage of the vapour to 4 and $3\frac{1}{2}$ per cent—gives no security against an overdose. A percentage that gives safe anæsthesia during ordinary breathing may lead to fatal collapse, if given during exaggerated breathing.

But by far the most important result of this excellent research is the evidence furnished concerning the effect of *ether* upon the heart, for he writes, “There is commonly seen

*British Medical Journal, Oct. 11, 18, 25, 1890.

a very striking and important difference between the relative influence of the two anæsthetics upon certain functions.

Ether can abolish the conjunctival reflex and induce profound anæsthesia with no appreciable direct effect upon the heart, while chloroform in causing a less deep anæsthesia, in which the conjunctival reflex is not abolished, may directly cause marked dilatation of the whole heart.

It seems to me that this conclusion derived from experiment accords very closely with clinical observation.

It may now be of interest if I briefly relate to you the methods adopted by me in producing anæsthesia.

In Hospital practice, where it is my duty not merely to make a patient unconscious for the needs of the surgeon, but also to instruct students in this art, I have to use to a certain extent ether, chloroform, and nitrous oxide gas, so that they may be well informed as to the peculiarities of these various agents. In my private practice I adopt exclusively the following method:—

The patient must have previously fasted at least four hours (except in cases of severe emergency), I then examine the mouth for false teeth, and shaky real ones, which a gag might easily displace. The best time to administer an anæsthetic is the early morning when the stomach is thoroughly empty. Unconsciousness is then induced by means of nitrous oxide gas, as it economises time, prevents struggling and minimises the amount of ether taken. If there should be much retching and symptoms of asphyxia, I suspend the ether and give a little chloroform, and subsequently resume the ether. I have kept in this way a patient unconscious and without embarrassing the surgeon for at least four hours, the patient suffering no inconvenient after effects from the anæsthetic.

I have been occupied in producing anæsthesia, almost daily for the past ten years, in hospital and private practice; during this period, I have conducted over 9,000 administrations, and see no reason for changing my methods, on the contrary, I am more than ever persuaded that ether as a routine anæsthetic is far the safest we have at present.

I always use an Ormsby's inhaler, because it is light, convenient, and not top-heavy, like Clover's instrument. But it has perhaps the disadvantage of being less economical of the ether.

In closing this paper, I feel it my duty to protest against what I consider to be a dangerous practice, and that is, the

administration of morphia in any form, immediately before and directly after the anæsthetic.

I am aware that the subcutaneous injection of the sixth of a grain of morphine, is believed by some to diminish oozing from the cerebral capillaries, but, I am of opinion that this is a dangerous practice on account of the difficulty in deciding where an untoward condition is due to morphine or the anæsthetic, whilst morphine administered before a patient is thoroughly awake, especially after severe operations, in my opinion tends to prolong the shock. With this mild homily, I bring my observations to a close.

PRESIDENTIAL ADDRESS.*

By HENRY CAMPION, Esq.

Gentlemen,—When I received a request from your Council to allow myself to be nominated for the office of President of your Society, I felt that for numerous reasons I ought to decline; but, being away for my holiday, and consequently in good humour with myself and all around me, and receiving, moreover, an exceedingly kind and pressing note from our worthy Secretary, who held out as an inducement the intimation that I should not be expected to write a formal introductory paper, (which intimation must be my excuse for the brevity of the few remarks I have to make this evening), in a weak moment I gave my consent; and the result is, gentlemen, that you see me before you in my present position, for the which I tender you my hearty thanks.

On few occasions have I found myself placed in a situation of so much difficulty and embarrassment as when called upon to take a prominent position in one of our professional societies. Nor is the feeling of mistrust in my own powers less on the present occasion when I find myself in the responsible position of president of your society; for it is a position which I feel it would have been impossible for me, in my present state of health, to have accepted but for the knowledge that I shall receive the cordial support not only of the executive, but also of the members generally; and also that any deficiencies and short-comings I may exhibit during my

* Delivered before the Manchester Odontological Society.

term of office, will meet with a kind and friendly consideration from you all. I am inclined to think that the true success of a society, such as ours, is evinced more by the status and efficiency of its executive, and especially so of him who presides over it, than it is by the number of its members; and I cannot but feel that it would, therefore, have been for the good of the society had your choice fallen on a younger and more active member who would have been able to devote more time and energy to the duties of the office than I am capable of doing. But here, gentlemen, you have placed me, and I will do my best.

On the present state of the Society it is not necessary for me to say much. The fact that it has been in existence five years, that it includes amongst its members nearly all the leading dentists in Manchester and its neighbourhood, and that it is able annually to publish a volume of valuable transactions, is of itself a sufficient proof of the necessity there was for the formation of such a society, and also of the wisdom and forethought of its founders.

But we must not limit the usefulness of such a society to the number of the papers read before it, and its annual volume of transactions, for there is the social element, if I may so term it, wherein I think we may find one of its most valuable functions, viz., bringing the members of the profession together face to face and into friendly communication with one another, thus affording opportunity not only together for a mutual interchange of ideas, but also of combining for the well-being of our profession.

Possibly few who are present here to-night can realize the condition the profession was in when my acquaintance with it first commenced. Combined action did not exist in any form. Schools of Dentistry had not been thought of, and an articled pupil was in no better condition than an ordinary mechanic. He was expected to do all of the work of the workshop, and in most cases was left to his own devices to acquire a knowledge of operating as best he could. Nor was the difficulty lessened by his inability to obtain suitable instruments, those furnished by the depots being of a most meagre description, primitive in form, and designed and manufactured by persons almost entirely ignorant of the uses for which they were required. Many of the best operators made their own instruments, the patterns of which were strictly guarded as professional secrets, each one looking on his brother practi-

tioners with suspicion and jealousy, fearful lest his own mode of operating should become known to them. In fact, we may say that in most instances the dentist of those days was, from a professional point of view, a solitary individual having scarcely a professional acquaintance.

I think I may safely leave it to you to contrast the state of things, thus so briefly glanced at, with the facilities for the acquisition of knowledge within the reach of the dental student and the younger members of the profession at the present time; brought about primarily by the gradual introduction into the profession of clever and educated men capable and willing to devote both time and energy to the instruction of all who wished to enter it; by the status given to the profession on its recognition by the College of Surgeons, the facilities afforded for practical instruction in our Dental Hospitals, and the numerous and efficient instruments supplied by the various depots.

It is for the junior members of the profession to remember that these, and all the other benefits which they enjoy, have only been gained for them by long and arduous toil, and by the devotion of much valuable time and energy by their predecessors; few of whom have been spared to see the happy result of their labours; and it is not, therefore, I think, asking too much in expressing a hope that they will guard jealously the privileges which have been handed down to them, and do all in their power to help to raise the profession to that honourable position which we are all so anxious for it to attain.

Now, I think, such societies as ours may be made an important element in bringing about this result; and it is for this reason that I am glad to forward its interests as far as I am able, and am here before you to-night in my present position.

Each of you have, no doubt, received a list of the papers which the Council has arranged for the present session. I am glad to see that casual communications and demonstrations are to take a prominent place amongst them, for I think they are some of the most useful and interesting parts of our meetings; and I trust that by the hearty co-operation of all the members, we shall find, when we reach the end of the session, that it has not been behind any of its predecessors in interest or instruction.

Reports of Cases.

EXTENSIVE COMPOUND COMMUNUTED FRACTURE OF UPPER AND LOWER MAXILLÆ, WITH SUBSEQUENT CLEFT PALATE.

BY RICHARD H. TUCK, L.D.S., England.

Dental Surgeon to the Pembroke and Haverfordwest Infirmary.

GARNHAM, a fine powerful seaman, whilst in discharge of his duties, in command of one of the boats belonging to trawling fleet in the Irish sea, was struck with tremendous force almost full in the face with a marline spike which was being temporarily used in connection with the trawl, and on which there was considerable strain at the time it gave way and caused the injury. His vessel being off the Irish coast, when the accident occurred, two days elapsed before he reached the Infirmary.



Upon admission, after a cursory examination, there was found to be extensive swelling, and effusion into the tissues of the face caused by the force of the blow, and a contused and lacerated wound dividing the lip and laying bare the symphysis of the lower jaw. The whole of the incisor region of the upper jaw, with the attached teeth, was forcibly driven back and wedged between the palatal portions of the maxilla.

Before any complete diagnosis could be made, it was considered advisable to administer an anæsthetic, which was done by Dr. Wilson, and it was then ascertained that the greater portion of the left maxillary bone had been forced almost

into the pharynx, and the front teeth with their alveoli were quite separated from it, so much so that it was thought better to remove them.

The direction taken by the fracture appeared to be in a line from just above the anterior nares to the maxillary tuberosity.

The right bone was also fractured, crepitation being very distinct when the lower portion was touched, on this side, however, the injury was less serious, and demanded comparatively little attention.

In the inferior maxilla, there was a compound comminuted fracture at the symphysis extending to the canine tooth on either side, and converging towards the mental process, the portions of injured bone were small and mostly detached from the periosteum, besides this there was a simple fracture near the left angle.

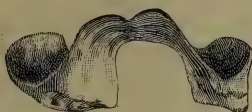


TREATMENT.

The patient being fully chloroformed, the tissues of the lower lip and chin were freely dissected from the maxilla and detached portions of bone removed. The edges of the fracture bone were sawn on either side so as to obtain a clean and more extended surface for ossification, and with an Archimedean drill two holes were made, one in each half of the bone, through which strong silver suture wire was passed and drawn tight, so as to bring the ends of bone well into apposition, after having twisted the wire with three or four turns, the end was cut off and forced back against the bone with the hope that it would become imbedded and surrounded with callus.

About five weeks from the date of this operation the patient complained of a good deal of pain under his chin, and upon examination it was found an abscess was forming, this was in due time opened, it was now observed that the suture had broken, and no doubt the irritation caused by the ends of wire was the means of bringing about this trouble.

The bone having other support, which will be explained further on, the suture was entirely removed and it was ascertained that ossification had become fairly established.



With respect to the treatment of the left superior maxilla, one can only say it was most difficult, at first an attempt was made to retain the bone in its proper position by the use of a four tail bandage and an ordinary gutta-percha splint with a small cork between the teeth, this however was found to be useless and irritating to the patient, as from the utterly detached condition of the bone it was impossible to keep it in its place, and it became very evident that something further must be done, I therefore, with the help of my assistant Mr. F. Mellersh succeeded in getting impressions of both upper and lower jaws which, as may easily be imagined were somewhat imperfect, nevertheless by a little manipulation of the models we managed to make them sufficiently good to work to and a plate was made which entirely imbedded the teeth top and bottom and with the aid of the bandages it kept everything well in its place and most rigid, all movements being entirely restrained, a diagram of the plate will accompany this, and as the sort of arrangement will doubtless be seen at a glance a further explanation will be unnecessary. During the insertion of this plate it was found expedient to remove it every day that the mouth which naturally became very offensive might be cleansed, this was done by the free use of Condy's Fluid.

It soon became evident things were mending fast and at the end of about seven weeks the plate was removed for good, and perfect union had now taken place. The left bone had been kept so well in its place that the teeth on either side were in the same plane.

Perhaps it may be as well to mention here before going further that the patients' temperature during the first week was 104 by night and 100 by day, and in the second week became normal during the day with a very slight rise at night.

Liquid nourishment was freely administered by a tube passed into the mouth.

A few days after the plate was removed the patient was considered convalescent and therefore discharged, unfortunately however within two months he returned with a sinus in the palate and on passing a probe, necrosed bone was easily detected. The opening was now enlarged and several sequestra of bone were removed, this produced a fissure about one and a half inches long, the edges of which failed to unite.

The man now complained of great inconvenience; being unable to smoke, which apparently was a great deprivation to him, and wished if possible to be operated upon with the intention of remedying the defect; this course was adopted, and he was again admitted to the Infirmary and chloroformed by Dr. Wilson, when Staphyloraphy was performed. There being nothing unusual in the cleft the operation was done in the ordinary way.

The edges of the fissure being pared, two incisions were made the whole length of the cleft and right down to the bone, and about half an inch from the edge of the fissure, I may remark hæmorrhage became somewhat troublesome at this stage, but was controlled by pressure. The flaps now formed were entirely separated from the bone and sutured.

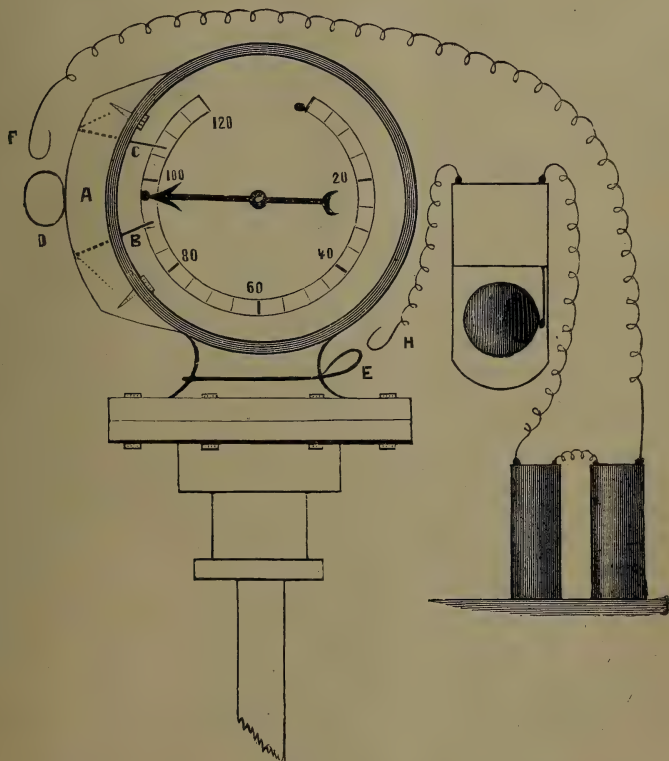
In five days the sutures were removed, and the operation proved to be entirely successful.

I have since repaired the loss the man has sustained artificially, and there is but little of his injury to be seen except a scar on his chin.

ELECTRIC SAFETY ALARM FOR VULCANIZERS.

By JAMES BROWN, L.D.S.I.

For many years past I have been residing in South Africa where coal gas cannot be obtained and where, consequently, the automatic Steam gauge for Vulcanizing could not be used. I have been obliged to use an ordinary steam pressure guage on the vulcanizer and a paraffin stove for heating and getting



up steam, this has necessitated a constant watch being kept on the guage, both whilst the steam was rising and afterwards, in order to keep the pressure steadily at the desired point, usually 100lbs; now, under these circumstances, it is not at all surprising that on several occasions, when the attention of

myself or assistants was called away about other work, that the vulcanizer was forgotten until we were suddenly reminded of it by hearing the safety plug in the lid blow out, from the steam having risen more rapidly than was expected : this set me thinking, with the result that I contrived a very simple electric alarm and fitted it to the steam guage in such a way that the hand on the guage rings a bell every time that it passes a point about 8 degrees either above or below the pressure used for vulcanizing. I have had this in use for a considerable time, and it has never yet failed to give me ample warning, and I can now devote my full attention to any other work so long as I remain within reach of the sound of the bell.

I will now fully explain this little device, so that any member of our profession may be able to make and fit it to his vulcanizer if he wishes to do so, and enjoy the same freedom from anxiety that I have had since using it.

The sketch will show at a glance the whole contrivance, a block of wood A is screwed on to the side of the guage after two one quarter inch holes had been drilled in the sides of the cap and side of guage to insulate and allow the two narrow, one eighth of an inch wide, strips of thin platinum foil B and C to pass through and project just far enough for the point of the hand to touch them as it passes. This strip of platinum foil is in one piece, passing from C to B through the wood and along a groove on the outside of the block. A piece of copper wire D is bent with a loop in the middle and runs along the grove over the platinum, each end of the wire being secure in the wood. Another piece of copper wire E is bent with a loop and fastened round the neck of the guage, the two ends of the wires, F and H, from the battery and bell, are bent into hook so as to pass into the two loops on the guage. The electric current passes from the wire H to that on the nick of the guage, thence through the metal of the guage, itself to the tip of the hand.

Now, when this hand comes in contact with C or B, the current will pass on to C or B and thence through D to the wire F. Hence the circuit will be complete, the bell will be rung and the needed warning given. An ordinary electric bell with sal-ammoniac battery may be used and placed at any convenient distance from the vulcanizer.

I may state, that to make the contact of the hand with the platina points quicker and sharper I made a hole in a small

round piece of Dental Alloy plate and stuck it on the end of the hand first being sure that there was no paint on the tip of the hand. The two ends of the wires from the bell and battery, when not in use, may be hooked out of the way to two nails in the wall or elsewhere. The two screws that fasten the block of wood to the cap or rim of the guage are screwed from the inside of the cap.

Although it has taken me a long time to describe this little contrivance it is really very simple and cannot get out of order when once properly fixed. I have had mine in use for a long time, and it has never once failed to give me warning when the vulcanizer required my attention, and I hope it may prove of equal service to any other members of the profession who may care to make and try it ; or perhaps some of the Dental depots might find it worth their while to make and supply the apparatus together with suitable bell and battery. It is evident that this idea is readily adaptable to the ordinary regulating guages to ring when the pressure is "up."

TO RETAIN COLLARS ON TEETH OR ROOTS.—Having found it difficult to retain on the teeth such collars as are cemented on for regulating purposes, the phosphate getting loose from the enamel. I found that by putting on the rubber-dam, drying the tooth and shellacking it first, this gave the desired ground for the cement to adhere to, and I was able to fasten a narrow band on a cuspid and central, to retain it for weeks, and in removing the same was compelled to split the band. The shellac varnish is not alone useful as regards the foregoing, but I think that on all roots, which it is possible to coat with it, the crowns will be much firmer held. There are many cases of bridge-work where one does not care to destroy the crowns by cutting them off, such a bridge of the upper incisors, retained by collars on the cuspid ; or lower centrals, say of one or two teeth, collared or capped to the laterals. If the cement in crown-work should in time dissolve from under the collars, the shellac does not, and there will not be any decay under the band, as it is usually the case after bands have been in position for two years or more.

In shickelling regulating appliances I would advise the addition of a very little powdered pumice or even plaster; this will give still more strength in the union with the cement. I should like to hear from any who may give the process a trial.

—W. G. LANGE.

Cosmos.

British Journal of Dental Science.

LONDON, DEC. 1st, 1890.

CHILDREN'S TEETH.

OF all the various duties we are called upon, from time to time, to perform, there is none which calls for more skill, knowledge, tact and patience than the treatment of children's teeth. Not only are we expected to do all that would be looked for when dealing with adults, but, in addition, are held more or less responsible for the future well-being of these teeth. Yet under what difficulties do we work! School, from whose troubles we had almost hoped to have escaped, is once more made the bane of our existence. School must on no account be interrupted, the work must be done in the holidays, and then what an old, old tale it is! The holidays have flown away, as only holidays will fly away, the time has gone in visits at the seaside, or in the merriments of the Christmas-time, the boxes are already being packed, when first one and then another finds, or has found for them, "just a little speck on one tooth." Immediately pen is taken in hand, the dentist, whose list is possibly already over full, is written to to give an appointment, on a certain day to see Tom. "Tom returns to school the day after, and has engagements every day till then, but there is only one little hole, and it won't take you long." So runs the letter. Well! somehow or other Tom is squeezed in and the appointment given. The day arrives, Tom is announced and shown in. But lo! he comes not singly, but "with all the world besides." The whole brood of children are brought, usually with two or three outsiders thrown in. "I thought," says the mother, "I would bring the others for you just to look

at, I don't think they want anything." And then the examination begins. "Tom's speck," is a big speck, in fact it could not well be bigger if any of the tooth were to be left, and there are several similar "specks." A second child, almost past the age for wearing regulation plates, has teeth arranged in a way more suggestive of ships in a gale at sea, than of the beautiful curve of the normal arch. Whilst, possibly, a third has both upper or lower molars on one side hopelessly decayed, in fact, but soft unwholesome roots, so that we begin to question whether, simply on the grounds of cleanliness, since they are even past crowning, we ought not to remove them. Now it may be said this case is overdrawn; we think not, in fact we have more than one such in our minds, and the question that arose with us, and which must arise with anyone who feels the responsibility of his position, is:—What ought we to do? We cannot attempt to lay down laws, indeed fixed rules are just so much waste paper and nothing else, each case must be treated on its own merits, and with regard to its own particular points, but what, after all, we should and must aim at is, prevention rather than cure. There is a time to speak and a time to be quiet,—this is a subject on which we should speak. Smiling faces and pleasant manners are all very well, and useful adjuncts in any practice, but the thing may be carried too far to be consistent with our duty. Rudeness is, of course not needed, but firmness is. Parents should be told what are the consequences of neglect of children's teeth, and their duty pointed out. We can perfectly understand and appreciate a reticence to speak for fear it may seem to be cadging for patients, but this should be laid aside. As a matter of fact most of us know, and may as well point out to our patients, that there is no surer way of ultimately lining the pockets of the dentist, than by staying away from him. There are some who object to look at the question from this, as they style it, money point of view; well! of course they may be superior to other men, but possibly if they were the father of six and not too well off in this world's goods, money would have

a tendency to make itself somewhat rudely obtrusive. We are sure he is the truer friend to such an one, who enforces the proverb, "A stitch in time saves nine."

The question must also be looked at from the point of view of the obligations of the dentist. There is sometimes a tendency to put off acting till, perhaps, the patient can better bear the necessarily incident pain. This is, of course, right enough if the patient is unable to stand it, though we sometimes doubt whether, the benefit derivable from a good, comfortable state of the teeth, will not outweigh a little temporary trouble. What we want specially to lay stress upon is, that as much should be done as can, even if the whole cannot. To illustrate our meaning by a case in point: A girl about eighteen is disfigured by the two upper centrals being decayed almost to the gum. She says:—they had been so for years with from time to time abscesses; the dentist is reported to have said, she had better wait till the girl had grown up before anything was done. Of course the dentist may not have meant this, patients do, even most unintentionally, misrepresent what has been told to them, but whosever the fault was, the fact remains that early treatment of these roots, with temporary fillings, would have prevented the frequent abscesses, and have done away with the troubles needed to render the root antiseptic, not to speak of a very acute and bad abscess which started directly the roots were touched.

There is one man, however, who is more responsible than anyone else for neglect of children's teeth, and he is the family medical man. The patients may excuse themselves on the ground of ignorance; the dental surgeons frequently know not of the children's existence, but neither of these pleas will avail the medical attendant. It is he, who has the power of tendering advice while there is time; it is he, who should submit his patients to a periodical examination; it is he, to whom we must trust in the future for seeing these little ones while disease can be taken in its early stages; alas! it is all too frequently he, who doesn't know a temporary from a permanent tooth.

The question, whether or no a professional man should be allowed to hold patents, for *bona fide* inventions of Dental appliances, is a vexed one. On the one hand, it is urged: that if patents were allowed, it would check the advance of science, and so hinder the profession serving the public to the full. On the other, it is said; that, if a man is not able to get some return for his thought, expense and labour connected with the working out of the idea, he is very unlikely to trouble at all about it, so that, from this point of view, the profession loses, rather than gains, by forbidding patents. Whatever view we may hold on these subjects, there is no doubt that the profession is practically unanimous in its condemnation of patents being granted either for quack nostrums, so-called cure-alls, or for methods of operating and particular operations. Although far too familiar with the former class of patents, we have fortunately, "at home," little or no acquaintance with the latter class. It is true itinerant teachers, have, from time to time, tried to obtain fees for granting licenses to practise some special method, but without exception, be the cause what it may, the thing has "fallen flat." Far different, however, is the state of things in the States, where, to quote the petition mentioned below, the number of patents on methods and processes in operative dentistry now in force is so great that the utmost care may not shield the dentist from this danger, even in the most ordinary and simple operations. The "Cutting off of a tooth," "The removal of tooth pulp," "The fitting of a band or ferrule to the end of a tooth," &c.

THIS state of things has pressed very heavily on the profession in that country, and protective associations have been formed which undertake the defence of their members, should any of these be prosecuted under the iniquitous acts. The "Central Dental Association of Northern New Jersey" has now taken the initiative in drawing up a petition to "The Senate and House of Representatives of the United States of America." This is being sent round to the other Societies

for signature. We heartily re-echo the hope of the Editor of "*Archives*" that :—"every dental society in the country will at once act on the above." We wish them success.

THIS society has also drafted the following act to prohibit the granting and issue of letters patent, in certain cases :—

"BE it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled.—That from and after the passage of this act, letters patent shall not be granted or issued to, nor obtained by any person, for any invention or discovery, or improvement thereof, or any method or process of repairing or restoring the human teeth, or the functions thereof, filling cavities therein, destroying the pulp or nerves thereof, reducing inflammation in the human mouth or teeth, giving to any person under treatment, or applying locally to any part to be treated or operated upon the drug, gas or substance, in aid of any surgical or dental operation, or for the purpose of alleviating the suffering caused by such operation or treatment, inserting in the mouth, or applying or affixing to the teeth, any dentures or other artificial appliances intended to replace, renew or restore lost, decayed and defective teeth, or of any method or process of surgical or dental treatment of, or operation upon, the human mouth or teeth, for any disease, decay or process whatsoever, or of any new or improved method or process whatsoever, in operative dentistry, and every such letters patent hereafter granted, or issued to, or obtained by any person, shall be absolutely void and of no effect.

2. That the Circuit Courts of the United States are hereby given jurisdiction and power to decree the annulment and cancellation of any letters patent, granted issued or obtained in violation of this act, upon suit brought in equity by any person against the owner or owners thereof. Such suit may be instituted in any district in which the owner or one or more of the owners reside, and in case any one of several owners be served with process, decree of annulment and cancellation may be made against all of the owners, in the same manner as if they had all been served with process.

3. This act shall take effect immediately."

Mr. H. HERBERT, Surgeon, I.M.S. writes from Aden to the *British Medical*, concerning a curious case of total Necrosis of left upper jaw and malar bone. He says :—On June 1st I removed the necrosed left upper jaw and malar bone of an Arab boy, aged 15 or 16 years. The orbital margin of dead bone projected through a gap in the cheek, and the lower eyelid was drawn down towards it and everted. The bone was easily extracted through an anterior incision. The disease was stated to have begun in a “boil” at the orbital margin three or four years before, and had progressed without pain or acute symptoms of any kind. The boy seemed of good constitution, and I failed to connect the illness with any of the recognized causes. In the specimen the two bones are complete, except the posterior and neighbouring inner wall of the antrum and a part of the nasal process. But they are pitted in places from superficial caries, especially the palatal process. Most of the teeth had dropped out, and the remaining ones were carious. But the boy’s other remaining teeth were sound.

After removal of the bone the gap in the cheek gaped still further, and had to be closed by a plastic operation, which, however, failed to release the eyelid, and has still left an opening close to the nose, exposing the nasal duct. The boy is now (October 8th) strong and well. The malar bone seems to have been entirely replaced, but the only sign of regeneration in the maxilla are some small plates, apparently of bone, in the anterior wall near the nose. The inferior turbinate bone was never seen. The other bones seem all healthy; and the aperture of the infundibulum is seen outside the middle turbinate bone discharging muco-pus. The case is noticeable from the extent of the necrosis and the obscurity of its origin.”

THERE were several remarks made at the dinner of the National Dental which may be taken as indications of current thought and opinions. Mr. Rushton had a grumble at the existing method of examining for the L.D.S. and contended that a student should be allowed to take the general and the

special subjects of the examination at different times. Now, if this were done a much more thorough test would have to be insisted on. At present the general work is of an elementary nature except on those points touching Dental Surgery, and to separate this examination into parts, would be like taking it in "Penny Editions." Although it may not be stated in black and white a certain standard is recognized, and this the student can always obtain from the "Tutors." That it is possible a student might be asked some out-of-the-way question is of course true of this as of other examinations, but possibilities and probabilities are two very different things. There is far too great a tendency to regard everything as being ordered and constituted with a view to the "Examination," whereas this should merely be looked at as a test, which, if men were not so prone to form such an absurdly high estimate of their own worth and knowledge, and could be trusted to do their work honestly, might be done away with.

MR. MORTON SMALE took up the parable and urged, that each dental student should be obliged to take the first and second conjoint examinations before taking the L.D.S. This is, of course, very desirable. It is a step towards enforcing the whole medical curriculum, and as such in accordance with the views maintained in these pages. But we question whether it would be fair to enforce this and still allow a two years curriculum. To our mind three would be required. We would rearrange the years pupilage. A student should be two years as pupil. At the beginning of the third he should join a General Hospital and attend the mechanical department of a Dental Hospital, which should, and no doubt will, be developed so as to give a thorough technical training. Having in this year passed his 1st conjoint, he is free to spend the last two years much as the student does now; the working student, we mean, not the one who spends his mornings smoking over the newspaper. Chemistry should *always* be passed during the two years of pupilage. Practitioners note this! It is *your* duty to tell your pupils.

By a curious coincidence, first, Dr. Richardson pointed out how it was he undertook any original research, the incentive was his friendship with Snow; second, Mr. Smale championed Science versus mere Finger-training. Now this is exactly why we have urged the need of a laboratory for scientific research, this would be the incentive to original work, and add the science to the finger-training. At present the time devoted to scientific instruction at a Dental School, may be said to be twenty-four hours, or three working days in two years, that is twelve lectures on Dental Anatomy and twelve on Dental Surgery, (the second course, being, for the most part, a repetition of the first, we need not count). We hope that Mr. Smale's *ideas* may soon have practical *results*.

ANOTHER point referred to was the need of space in the hospital. We know this obtains at both the large Dental Schools in London. But is it not a little bit of an absurdity that all the patients should be rushed into the short working space of a morning and then the whole place be shut up in the afternoon? As far as the students are concerned we are sure there are quite a number who could better attend in the afternoon than in the mornings. It seems to have been lost sight of that in many general hospital schools, where matters are not specially arranged to suit dentals, the morning is *the* busy time for the first year. Money spent in a building is so much dead capital, which any man of most elementary business knowledge would tell you, must be kept as small and made as much use of as possible.

Two prizes have been newly instituted at this hospital, an "entrance" one, value £15, and one for a prize-essay given by Messrs. Ash & Son. It is a pity the latter was not made of the same value as that given by the same firm to the London Dental Hospital. "Distinctions are odious."

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

AMADOU CYLINDERS.

Messrs. Ash & Sons send us a sample of some cylinders of amadou, which they have recently produced and placed on the market.—They are made in several sizes and will be found very useful for drying out cavities and conveying medicaments. The price is not stated but if they are anything like a reasonable figure, we are sure the Profession will be glad to adopt them in practice.

Abstracts of British & Foreign Journals.

ACTION OF NITROUS OXIDE, NITROGEN, OXYGEN, AND CARBONIC ACID UPON THE CIRCULATION.

Drs. H. C. Wood and Cerna have carried out experiments (*Therap. Gazette*, August and September) to determine the action of nitrous oxide and other gases on the circulation. They find that after the inhalation of nitrous oxide gas there is almost always a rise in the arterial pressure, which rise varies very greatly in its extent, as well as in the rapidity of its occurrence. Sometimes it is immediate and excessive; usually, however, it is slowly produced, and only moderate in extent. In some cases it occurs a considerable time before the abolition of the conjunctival reflexes, while occasionally its coming on is postponed until after the disappearance of the

eye reflexes. In all the experiments, if the inhalation were continued, the blood pressure finally began to fall, and at last reached the zero line ; always, however, the pressure was well maintained until long after the complete cessation of respiration, and not through failure of the heart. The maintenance of the circulation so long after respiration is paralysed is very remarkable, and is of great practical importance. Nitrous oxide would appear, directly or indirectly, to stimulate the heart, and to keep up this stimulation at a time when the respiratory function is almost completely obliterated. Stoppage of respiration can frequently be relieved by artificial respiration, but we have no substitute for an arrested heart, hence the safety of nitrous oxide anæsthesia. The authors point out, however, that the great rise of pressure which sometimes occurs is not without its dangers, as it has caused apoplexy, and, according to Lafont, diabetes mellitus and albuminuria. The rise in pressure is due to vasomotor spasm, the subsequent fall to vasomotor paralysis. There is slowing of the pulse, accompanied by a pronounced increase of energy in the heart's contractions, and increase in the size and force of the pulse wave ; very late in the poisoning there is excessive rapidity and feebleness of the pulse (corresponding to the period of low blood pressure mentioned previously). The slowing of the pulse is due to stimulation of the vagi. A mixture of nitrous oxide with 10 per cent. of oxygen has no anæsthetic action, nor does it raise the blood pressure, but it shows the pulse. Inhalation of nitrogen causes complete anæsthesia about as quickly as nitrous oxide. The two gases also act on the circulation in much the same way ; hence it is very probably the case that both cause anæsthesia by shutting off the supply of oxygen to the blood. The authors are of opinion that both simply cause asphyxia with consequent unconsciousness. Inhalation of oxygen had no influence on the circulation. The oxygen was inhaled for from two to four minutes, and was given undiluted with air. There was no anæsthesia. Inhalation of pure carbonic acid generally produced anæsthesia within a minute, and there was a rapid fall of blood pressure till death. When diluted with oxygen or air it increased the arterial pressure, having apparently most power when mixed, with oxygen in the proportion of two to one. This rise is due to stimulation of the vasomotor centre in the medulla. The pulse is always greatly slowed.

British Medical.

A GENEROUS AND HEROIC DENTIST.

The Enterprise, New Glasgow, N. S., Saturday, Oct. 18th, published a graphic account of a most disastrous and heart-breaking shipwreck at Little Harbour, Sunday night, the 12th, by which 16 men lost their lives. The vessel was the barque Melon Erly which sailed from Quebec, Oct. 1st, bound for Greenock, Capt. Alsen and crew of 22 men. On Sunday night, the 5th, they encountered a heavy gale from which the ship sprung a leak and soon became waterlogged and unmanageable. They floated around at the mercy of the winds and waves until Sunday, the 12th at 2 p.m., when they struck a edge at Pey's Island, Little Harbour. Shortly afterward the captain and 15 men started in the ship's long boat to reach the shore, but the surf and awful force of the undertow was such that only one man, the Quebec pilot, reached the shore. Every effort to launch a boat was tried, but the sea was such that no boat could live. During the night two seamen succeeded in reaching shore by swimming.

On Monday night, Dr. E. P. McLean, a dentist of Boston, organized a rescuing party at New Glasgow and proceeded to the scene of the disaster, which they reached at 1.30 a.m. The wreck could be seen about 100 yards from the shore, a dismantled, disabled hull, with gear, tackling and everything gone. Dr. McLean and his party set about at once to devise some means to reach the distressed and shipwrecked sufferers. The doctor and Watkins Williams, an *Enterprise* reporter, discerned the barque's life-boat about $\frac{3}{4}$ of a mile down the beach but slightly damaged ; this was speedily repaired, and with the aid of neighbouring farmer was soon conveyed along the beach to a point opposite the wreck. At 10 a.m. sufficient help had been secured to launch the boat containing the following rescuing party : Dr. E. P. McLean, Watkins Williams, Capt. P. Graham, James McGlashan, Daniel Frasin and A. Boudrat. After a severe struggle the rescuers succeeded in reaching the wreck, and in a few seconds the remaining survivors were lowered by a rope into the boat and were brought safely to shore. Dr. McLean's prompt action in organizing a rescuing party with all the necessary supplies, even to plenty of dry clothing for the sailors, and paying all expenses, is highly commended, and great praise was awarded him for his prompt, generous and heroic action.

The Archives.

Reports of Societies.

THE MANCHESTER ODONTOLOGICAL SOCIETY.

THE inaugural meeting of the society for 1890-91 was held at the Grand Hotel on Tuesday, October 7th, the President, Henry Campion, Esq., in the chair.

DISPLAY OF INSTRUMENTS, &c.

The Dental Manufacturing Co., made a fine display of their goods. The Secretary announced that, as Dr. Shaw felt unable to accept the office of one of the Vice-Presidents, Mr. Murphy had been elected by the Council in his place, and Mr. Whittaker had been elected to the vacancy thus created in the Council.

The President then delivered his Inaugural Address. [See page 1070.]

DR. SHAW said he rose to express the thanks they all felt to Mr. Campion for his admirable address, and to express his own satisfaction in seeing him in the Presidential chair. They all thought he was the man to occupy that position for this year. He (Dr. Shaw) had urged the matter upon Mr. Campion for a considerable time and with much force, and it was now seen with eventual success; and he was sure that he expressed the feelings of every member of the society when he said they were exceedingly glad to find that Mr. Campion had consented to occupy the position for which he is so well fitted (hear, hear). He knew how difficult it might become for him to attend all their meetings; but if he could not attend, they had fortunately two Vice-Presidents who would be able to do all that was required. He (Dr. Shaw) was pleased that the President had referred to the Society as having been so useful in promoting good feeling among dentists, and also in furthering those great interests which all who had the welfare of the profession at heart held so dear. He was also pleased to see in his place that evening his old and valued friend, Mr. Smith, without whose invaluable aid and hearty cooperation the Society would never have come into existence, or have been established on the firm footing it now had. It was a great pleasure to see that he still took such interest in all they did. Dr. Shaw concluded by again

expressing the satisfaction they all felt in seeing Mr. Campion in the chair. (Applause.)

The TREASURER for the past year then presented his annual report showing the sum in hand at the beginning of the year, the amount of the receipts, the expenses, and the balance now in hand.

The PRESIDENT said that, although it was satisfactory to find they had so large a balance in hand, they must not rest content, as they would find the Society had need of money for many things.

CASUAL COMMUNICATIONS.

MR. SMITHARD gave some particulars of a case in practice. He said the plaster model shown was prepared from an impression taken of the palate and pharynx of a male patient.

It is seen that the free border of the soft palate had become adherent to the posterior wall of the pharynx, leaving a small hole immediately behind the hard palate; this being the only communication between the nasal cavity with corresponding portion of the pharynx, and the mouth and lower section of pharynx.

The patient is about 37 years of age. When 15 years old he had ulceration of the throat for a period of 2 years, with no medical treatment. The ulceration has involved the free borders of the soft palate, uvula, and along the median line as far as the hard palate. Adhesions have taken place between the pharynx, the posterior pillars of the fauces, and the border of the soft palate; the tension exercised by the levator palati only having prevented the complete separation of the oral and nasal cavities.

Behind the pharynx is a hard crucial cicatrix. The sense of hearing is not impaired, taste only a little affected, but the sense of smell is almost destroyed. There is no history of the discharge of any bone.

MR. PETER HEADRIDGE called attention to a new "Cord Engine," made by S. S. White & Co., which he had brought to the meeting for inspection. He said he had used it for the last six months, and had found it a thoroughly practical instrument in all points. The angles were more acute, and the freedom with which they could use the hand-piece was better than in any instrument he had ever used. Another advantage was that any hand-piece used on Bonwell's instrument could be used on the White machine. He had thought

the Bonwell engine the best heretofore, but he now thought this an improvement even on the Bonwill.

MR. COLLETT said that, from his experience with engines he had found nothing to equal in flexibility the "Shaw" engine.

MR. HEADRIDGE replied that, as he had never used that instrument, he was not able to offer an opinion upon it.

MR. SIMMS said he thought the distinguishing feature of White's new cord engine was that the power acted more directly on the handpiece.

DR. SHAW said that he had never before seen the new engine, but the suggestion of Mr. Simms was an important one. He had gone through some experience with engines and of course, the more readily and easily they could apply the power from the foot to the handpiece the better was the machine; and if the new cord engine had really improved the manner of conducting the power, it had achieved an important result.

THE DECAY OF TEETH.

MR. G. G. CAMPION showed a plate which had been used to expand the arch in the region of the bicusps, and made some remarks on the arrangement of the steel springs for such cases.

DR. SHAW said that patients often asked how it was that teeth decayed so fast now, thereby implying they did not decay in former times. But he thought there was some mistake; for in reading the Proverbs, he found, we were told that "Confidence in an unfaithful man in time of trouble is like a broken tooth, and a foot out of joint." It might, therefore, be concluded that decay of the teeth was not so much more frequent now than in former times.

MR. HEADRIDGE thought that teeth did decay more than formerly, and suggested that Dr. Shaw was the one to give them a paper on this subject, so that it could be ventilated.

The PRESIDENT also said he could not altogether agree with Dr. Shaw. He was at any rate sure that decay was more common now in the manufacturing districts of the North than in the South; but this might be owing to some local causes.

THE LIBRARY.

MR. G. G. Campion, the Librarian, announced that a book case had been bought, and he hoped the list of books

would be shortly settled upon. Any one who had any books to present would oblige by doing so at once, as the committee wished to have the Library in full swing in a month or two.

VOTE OF THANKS.

MR. PLANCK moved, and Mr. Whittaker seconded, a hearty vote of thanks to the Dental Manufacturing Company for the excellent display they had afforded the members, which was carried unanimously.

ALTERATION OF RULES.

The meeting was then declared a special one to consider the alteration of Rule 9.

The Secretary explained that the Council thought the Librarian should have a place on that body; and it was, therefore, proposed to add to the end of Rule 9 the word "Librarian." The motion was unanimously agreed to.

The meeting then terminated, but more than an hour was afterward spent in looking at the display of goods, and in conversation.

Review.

Transactions of the American Dental Association. Published by Mr. H. D. Justi, of Chicago.

This annual volume is a record of this year's meeting of the above association, held at Excelsior Springs. It is nicely bound and thus collects together the various records, which have previously appeared in the Journals, notably the *Dental Review*. It will be of interest not only to those who attended the meeting, but to others who desire to be in touch with current opinion on dental topics. The sections were—1. Prosthetic Dentistry, Metallurgy & Chemistry; 2. Dental Education, Literature, and Nomenclature; 3. Operative; 4. Histology and Microscopy; 5. Materia Medica and Therapeutics; 6. Physiology & Etiology; 7. Anatomy, Pathology and Surgery. Papers were read at each of these Sections, but why W. S. How's paper on "The Hillischer Dental Notation, with Indices," was included in the section on "Physiology and Etiology, we are at a loss to understand."

The Micro-organisms of the Human Mouth. The Local and General Diseases which are caused by them. By Willoughby D. Miller, D.D.S., M.D., Professor of the University of Berlin.—Published by the S. S. White Dental Mfg. Co.

We have received a copy of this important work. It embodies the results of years of experiment and research on the part of its distinguished author, who is a recognized authority in this department of dental science. The book contains nearly 400 pages, octavo, handsomely printed on fine paper, with 128 engravings on wood, one chromo-lithographic and two photo-micrographic plates. A full review will appear in our next issue.

Day Book for Dental Surgeons. Designed by Mr. Sarson, of Grange House, Llandudno.

THIS book, which may be obtained at any of the Depots, will be appreciated by all those who like to enter their work in tabulated form. The pages are divided by lines into columns which are headed to include practically all the different operations we are called on to perform, a special space being left for "remarks."

Dental News.

Forty-nine new students have joined the Dental Hospital of London this session.

On Saturday, November 15th, Dr. R. Theodore Stack was presented by his colleagues of the Dental Hospital of Dublin, with a portrait painted by Mr. Osborne. Dr. Stack, as honorary secretary of the hospital, has been indefatigable in obtaining funds for the new Dental Hospital, and already a sum of £2000 has been lodged in bank to the credit of the building fund. Sir William Stokes, in presenting the portrait, assured Dr. Stack that he carried with him the best wishes of his friends; that he might be long spared in health and strength to continue the good work in which he was engaged.

At the recent meeting of the Council of the College of Surgeons of England, the following gentlemen having passed the necessary examinations were admitted Licentiates in Dental Surgery :—Students of

Charing Cross and Dental Hospitals.

Acton, George Harris, Barnes.

Appleton, James Enderby, M.R.C.S., Blackheath.

Bull, Ernest Rogers, Camden Town.

Burton, Francis, Norwood Road.

Davis, William Herbert, Gunnersbury.

Larbalestier, William Robert, Ilminster-gardens.

May, William, Thorerston, Devon.

Parsons, Ernest, Horseheath, Cambridgeshire.

Schelling, Carl, Upper Gloucester-place.

Tomlin, Louis Crowhurst, New Cross.

Wheatley, William Henry, Victoria-park.

Woolf, Michael, St. John's Wood.

Middlesex and Dental Hospitals—

Dorman, Henry, Horsley, Gloucestershire.

Efford, Charles Furselman, Brockley.

Hall, George, Caledonian Road.

Summers, James West, Norton Folgate.

St. George's and Dental Hospitals—

Holford, Walter Stanley, M.R.C.S., Sutton.

St. Thomas' and Dental Hospitals—

Turner, Joseph George, Ealing.

Middlesex and National Dental Hospitals—

Cutts, Frederick Edward, Lancaster.

Keevil, George Mulready, Keppell-street.

Lombardi, George, Great Marlborough-street.

London and National Dental Hospitals—

Moore, Alfred, Goodman's Fields.

Edinburgh and National Dental Hospitals—

White, Percy Harry, M.R.C.S., Cadogan-square.

Manchester Hospital—

Buckley, William Henry, Oldham.

Birmingham Hospital—

Marson, Cyril Darby, Stafford.

Eleven candidates were referred.

At this meeting of Council of the Royal College of Surgeons of England, a report was read from the Board of Examiners in Dental Surgery, saying that they had consulted the legal adviser of the College, and were informed by him that the Council had not the power under the Charter and by laws to institute, as was suggested, an Honorary Examination in Dental Surgery. A report was received from the Laboratories' Committee, stating that the rooms had been completed and were now in working order. Seven applicants had been granted permission to work in the laboratories, four of whom had already commenced their investigations. The Committee suggested that a sum of £500 should be granted for the purchase of a lantern with projection microscope and other apparatus, and to defray any further outlay that may become necessary. Attention was called to the fact that in the original estimate it was contemplated that the sum required to furnish the laboratories sufficiently might amount to £5,000, whilst, with the additional grant above-mentioned, the committee will have fitted up the laboratories, library, and theatre for half the amount, that is, £2,500.

ANNUAL DINNER OF THE PAST AND PRESENT STUDENTS OF THE NATIONAL DENTAL HOSPITAL AND COLLEGE.—On Friday, November 21st, the Dinner of the Past and Present Students of this School was held at the Holborn Restaurant, B. W. Richardson, Esq., M.D., F.R.S., being in the chair. A large company assembled, including many visitors, among these being Messrs. Stanley Boyd, David Hepburn, Henry Morris, Morton Smale, Smith Turner, Arthur Underwood, Felix Weiss, and Dr. Dudley Buxton. During the dinner, the "Bijou Orchestra" performed a selection of music. After the toast, "The Queen," had been given by Dr. Richardson, he presented the prizes awarded during the past year, to the Students.

The following was the Honors List :—

Bronze Medals.—*Dental Anatomy*, Mr. Moore ; *Dental Surgery*, Mr. Bascombe ; *Dental Mechanics*, Mr. Moore ; *Metallurgy*, Mr. Bascombe ; *Operative Dental Surgery*, Mr. Moore ; *Dental Materia Medica*, Mr. Moore ; *The "Rymer" Gold Medal* for General Proficiency, Mr. Moore ; *The "Ash" prize* of Three Guineas for the Thesis on Hæmorrhage after Tooth Extraction, Mr. Arnold Prager ; *The Entrance Exhi-*

bition of the value of £15, Mr. McFarlane ; *Students' Society* prize, Mr. Harburg ; *Mechanical Work*, Mr. Keele.

Certificates. — *Dental Anatomy*, Mr. Cutts ; *Dental Surgery*, Mr. Burberry Rowe ; *Dental Mechanics*, Mr. Prager ; *Metallurgy*, Messrs. Johnson and Keele ; *Operative Dental Surgery*, Mr. Bascombe ; *Dental Materia Medica*, Mr. Prager ; *Elements of Histology*, Mr. Bascomb.

Mr. Moore is thus *the man* of his year, but eMr. Bascombe who, we learn, is still a first year's student, comes a good, second. Mr. Henri Weiss, the Dean, introduced the students.

The Chairman then proposed the toast of "The Hospital and Staff," and in doing so he referred to the foundation of the School 33 years ago. He had been giving lectures at the College of Dentists, and one evening, at supper, the idea was mooted of founding a School. He recalled how the school was founded, and the names of his colleagues, Mr. (now Sir) Spencer Wells, Mr. Cobbold, Mr. Hulme, and others. He traced its progress to the present day, and congratulated it on its prosperity. He had lately been over the school, and had been struck with the fact, that though so many, who had assisted at the foundation, had passed away to another world, yet the school went on the same as ever. He was told the work was greatly cramped for lack of room at the Hospital, and that before long it would migrate to another and more commodious building, yet he felt they would all feel sorry when the day came for them to leave the building around which had gathered so many time-honoured associations.

The Dean, in responding, called attention to their recent success at the Examinations at the College of Surgeons when all their candidates were successful. He mentioned the excellent spirit of competition with an absence of jealousy which existed between the different Dental Schools of the metropolis. He felt sure there was room for all.

Dr. Maughan proposed the "Past and Present Students," Messrs. Rushton and Bascombe replying.

Mr. Alfred Smith then proposed "The Visitors," and Mr. Morton Smale responded.

Dr. Cunningham gave "The Chairman," who briefly replied.

Glees and Songs enlivened the proceedings, and the event must be recorded as one of the most successful of Dental Dinners.

LEGAL.

LEGISLATION IN CANADA.

An Act to Regulate the Practice of Dentistry in the Province of British Columbia.

[Assented to, 6th April, 1886.]

Whereas the profession of dentistry is extensively practised in Europe, the United States and the Dominion of Canada ; and whereas the said profession of dentistry is protected by law in Europe, the greater portion of the United States and in parts of Canada ; and whereas it is expedient for the protection of the public that there should, by enactment, be established a certain standard of qualification required of each practitioner of the said profession or calling, and that certain privileges and protection should be afforded to such practitioners :

Therefore, Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of British Columbia, enacts as follows :

1. That it shall be unlawful for any person to practise, or attempt to practise the profession of dentistry or dental surgery in the Province of British Columbia without having first received a diploma from the faculty of some reputable dental college, school or university department duly authorized by the laws of Great Britain and its dependencies, or the laws of some foreign government, and in which college, school or university department there was at the issuance of such diploma annually delivered a full course of lectures and instructions in dentistry or dental surgery, and without having had issued to him a certificate under the provisions of this Act : Provided, that nothing in section 1 of this Act shall apply to persons who have been three months in actual practice in this Province previous to the passage of this Act, except as hereinafter provided, and nothing in this Act shall be so construed as to prevent physicians, surgeons or others from extracting teeth.

2. A Board of Examiners, consisting of three practising dentists, residents of this Province, is hereby created, who shall issue certificates to persons in the practice of dentistry or dental surgery in this Province who have been three months in actual practice in said Province previous to the

passage of this Act ; and also to decide upon the validity and sufficiency of character of such diplomas as may be subsequently presented for registration as hereinafter provided.

3. The members of said Board of Examiners shall be appointed by the Lieutenant-Governor in Council upon the passage of this Act, and shall serve for a term of three years, excepting that the members of the Board first appointed shall hold their offices as follows : One for three years ; one for two years ; one for one year, respectively, and until their successors are duly appointed.

In case of any vacancy occurring in said Board, such vacancy shall be filled by the Lieutenant-Governor in Council from those in actual practice in the said Province.

4. The said Board of Examiners shall keep a record in which shall be registered the names, residences or places of business of all persons authorized under this Act to practise dentistry in this Province. The said Board shall elect from its members a president and a secretary, and shall meet at least once a year, and whenever applications for certificates shall be made. A majority of the members of said Board shall constitute a quorum.

5. Every person engaged in the practice of dentistry within this Province at the time of the passage of this Act shall, within three months thereafter, cause his name and residence and place of business to be registered with the said Board of Examiners, upon which said Board shall issue to such person a certificate duly signed by a majority of the members of said Board, and which certificate shall entitle the person to whom it is issued to all the rights and privileges set forth in this Act.

6. To provide for the proper enforcement of this Act, the said Board of Examiners shall be entitled to the following fees (to wit) : For each certificate issued to persons engaged in the practice of dentistry in this Province at the time of the passage of this Act, the sum of ten dollars ; for each certificate issued to persons not engaged in the practice of dentistry in this Province at the time of the passage of this Act, the sum of ten dollars ; for each certificate issued to persons not engaged in the practice of dentistry at the time of the passage of this Act, the sum of twenty-five dollars.

7. There shall be allowed and paid to each of the members of the said Board of Examiners such fees for attendance, in no case to exceed ten dollars per day, and such reasonable

travelling expenses as the said Board shall allow from time to time. Said expenses shall be paid out of the fees and penalties received by the said Board under the provisions of this Act.

8. All moneys in excess of necessary expenses shall be held by the secretary of said Board as a special fund for meeting the expenses of said Board, he giving such bonds as the Board may from time to time direct.

9. The said board at its first meeting, and from time to time thereafter, shall make such rules, regulations and by-laws, not inconsistent with the provisions of this Act, as may be necessary for the proper and better guidance of the said Board, which rules, regulations and by-laws shall first be published for one month in the *British Columbia Gazette*, and in one or more newspapers circulating in the Province. Any or all of such rules, regulations and by-laws shall be liable to be cancelled and annulled by an order of the Lieutenant-Governor in Council.

10. The secretary of said Board shall, on or before the fifteenth day of January in each and every year, enclose to the Provincial Secretary an annual report of its proceedings, together with an account of all money's received and disbursed by said Board of Examiners; also a list of the names of all persons to whom certificates have been granted, and the qualifications therefor, and such lists shall be published in the *Gazette*.

11. If any person, after the period of three months after the passing of this Act, not holding a valid certificate, practises the said profession or calling of dentistry or dental surgery, or wilfully and falsely pretends to hold a certificate under this Act, or takes or uses any name, addition or description implying that he is duly authorized to practise the profession or calling of dentistry or dental surgery, he shall, upon a summary conviction thereof before any justice of the peace, for any and every such offence pay a penalty not exceeding one hundred dollars nor less than twenty-five dollars, and the half of any such penalty shall be paid to the Board of Examiners and it is further provided that no person who is not qualified under the provisions of this Act shall recover in any court of law for any work done or any materials used by him in the ordinary work of a dentist.

12. Any British subject being a resident of this Province (not entitled to the privileges and benefits of this Act under

section 1) desirous of entering the profession or calling of dentistry, shall be apprenticed to a practitioner duly qualified under this Act for a period of three years, and shall file his articles of apprenticeship with the Secretary within one calendar month after the said articles have been executed.

13. Any such person having been so apprenticed as afore-said shall, at the completion of the term of his apprenticeship, and upon the production to the secretary of satisfactory evidence of his having served his said apprenticeship, and of his good moral character, be entitled to be examined as to his fitness to practise the profession or calling of dentistry before the Board of Examiners appointed under this Act, and shall, upon passing such examination to the satisfaction of the said Board, receive a certificate, upon the payment of a fee of ten dollars, which shall entitle him to all the rights and privileges of this Act.

An Ordinance to regulate the practice of Dentistry in the North-West Territories.

The Lieutenant-Governor, by and with the advice and consent of the Legislative Assembly, enacts as follows :

1. That no person shall practise the profession of dentistry or dental surgery in the North-West Territories without having first received a certificate as hereinafter provided, entitling him to practise dentistry or dental surgery.

That such certificate shall be issued by the Clerk of the Legislative Assembly, upon production to him of a diploma of graduation in dental surgery from the faculty of any Canadian dental college, or the faculty of any Canadian university having a special dental department, or from any such institution duly authorized by the laws of Great Britain, or any of her dependencies ; or a license to practise dental surgery issued by any of the Provinces of the Dominion of Canada, or a diploma or license from a foreign dental institution, which required at the time of issue of such diploma or license, attendance at a regular course of lectures, and an apprenticeship of not less than two and one-half years ; or who has been in regular practice in the North-West Territories as a dentist or dental surgeon for a period of one month immediately preceding the passing of this Ordinance, and it shall be the duty of the persons claiming to be entitled to the certificate required by this section, to produce to the said

clerk evidence, satisfactory to him, of his being entitled thereto.

Provided always, that nothing herein contained shall be construed to require physicians, surgeons, or others to take out such certificate for the purpose of qualifying them to extract teeth.

3. That before any certificate is granted the applicant shall pay to the general revenue fund of the Territories, the sum of 25.00 dols., unless he is a person who, at present and for one month immediately preceding the passing hereof, has been in the actual practice of dentistry and dental surgery in the North-West Territories, and in such case he shall pay into said fund the same sum of 5.00 dols.

4. After the period of six months from the passing of this Ordinance, any person, not holding a valid certificate issued by the said clerk as aforesaid, who practises dentistry or dental surgery, except extracting teeth, shall be guilty of an infraction of this Ordinance; and, upon conviction by any justice of the peace within the Territories in a summary manner, pay a fine not less than 20.00 dols., nor more than 100.00 dols., in the discretion of said justice and costs.

That no person who has not received the certificate required by this Ordinance shall recover in any court of law any fees or money for any materials provided by him in the practice of dentistry or dental surgery, except for extracting teeth.

VACANCIES.

TAUNTON AND SOMERSET HOSPITAL—Honorary Dental Surgeon. Apply to the Secretary, 13, Hammet-street, Taunton

ROYAL SOUTH HANTS INFIRMARY, Southampton.—Dentist. Particulars as to qualifications, etc., to be obtained of T. A. Fisher Hall, Secretary, to whom applications are to be made by November 28th.

Correspondence.

The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

DEAR SIR,—In your issue of October 15th, I read a clever review of M. de Chemant's book. "Dessertation on Artificial Teeth," the fifth edition, published 1816. It will, I am sure, interest you to know that I have yet an earlier edition of the same work, viz., the fourth, published in 1804. Now, my father, who was born the end of the last century, 1792, no doubt used M. de Chemant's original manufactures, for I remember well when a boy, now some years ago, that he obtained his teeth from France. I quite believe that even now some of these same teeth are in the possession of my family.

I am, &c.,

OCTAVIUS A. FOX, L.D.S., Eng.

Brighton.

GLASS INLAYS.

To the "Editor of the British Journal of Dental Science."

SIR,—Allow me in reply to Mr. Braun's question, to state that about seven years ago, and often since, I have carried out a series of experiments for perfecting Inlay fillings, and I may state that I have met with success. That it is possible to produce perfect Inlay stopping, I have proved long ago. I had the pleasure of meeting a patient of mine a short time since, for whom I inserted two Inlays in the two lower central incisors (this was about six years ago), and it was very pleasing to me to notice that they were quite perfect and appeared as if they had only been finished off the day previously, for there was no perceptible change in the condition of the tooth or inlay. I remember very well the time and attention I gave the case, so as to secure an accurate adaptation of the Inlay to the walls of the cavity. They are now retained by cements, excepting that before I forced them into position the cavities were painted out with chloropercha. My mode of making and inserting Inlays, I demonstrated at a meeting of dental students and gentlemen of the profession, held at the Leicester Square Dental Hospital some few years ago, then I made use of a body composed of ground mineral teeth which I knew fired at a low temperature. The body which I use now is different, being translucent, fusing easily, possessing very little shrinkage, and can be made to resemble the colour of natural teeth admirably. My experience with ground glass has been discouraging, and consequently I gave that up long ago, and from what I know of its nature, I should say that it is very unsuitable.

Yours truly,

A. B. VERRIER, L.D.S.

South Kensington.

British Journal of Dental Science.

No. 550. LONDON, DEC. 15, 1890. VOL. XXXIII.

SOME PRACTICAL POINTS INVOLVED IN THE RELATION OF THE UPPER TO THE LOWER TEETH.*

By LEONARD MATHESON, L.D.S.

Mr. President and Gentlemen,—The brief paper that I have the honour to read to-night must appear to you to be of a decidedly heterogeneous character, when I say that it touches upon subjects apparently so disconnected in interest as contour fillings, regulating frames, all-gold crowns, and the habitual extraction of the sixth-year molar : and I feel that a word of explanation is due as to my reason for dealing, in one paper, with such various topics. My intention, then, is not to offer any elaborate presentation of the mathematical or mechanical principles involved in the articulation of the teeth, but simply to bring before you one or two matters of every-day interest. I regret indeed that I am not prepared to lay before you anything new or original, but it has occurred to me that a quarter of an hour might be not altogether wasted in considering some principles and methods of practical interest as viewed from a common standpoint—that, namely, of the “bite”—a standpoint which is,—I am bound to say, judging from prevalent modes of practice, far too frequently overlooked. I certainly need not remind the members of this Society of the fact—evident to the very youngest of Macaulay’s school-boys—that one jaw or set of teeth is useless without its antagonist, and that the value of even individual teeth must largely depend on the mutually harmonious relations existing between it and its opponents : but that these facts are constantly being forgotten or ignored is, I fear to all of us, a matter of every-day experience.

* A paper read before the Odontological Society.

I propose to group my remarks under the following heads :—

I. The articulation of the teeth in relation to the etiology and treatment of approximal decay.

II. Irregularities of articulation as productive of pathological conditions of the alveolo-dental periosteum.

III. The “bite” as affecting certain modes of treatment adopted in the correction of irregularities.

I. *The articulation of the teeth in relation to the etiology and treatment of approximal decay.*

As a factor in the production of approximal decay the “bite” holds an important place. It is due to the action of the “bite” that food becomes wedged into approximal spaces, and by its decomposition promotes decay. Sometimes the very beginning of decay is due to this cause, and even in the larger number of cases where the actual inception of disease occurs before there is any interspace to admit of the lodgment of food, yet when once the coronal wall of the cavity breaks in, allowing food to enter in appreciable quantity, the rate of decay is generally much accelerated and its ravages made to extend rapidly over the whole approximal surface. In those instances where the lodgment of food is the primary cause of decay, the space which admits the food is due to one of three things,—either to simple want of contact in two neighbouring teeth, otherwise normal, or to a flat instead of a contour filling having been employed on one or both sides of the space, or to the injudicious use of contour instead of flat fillings.

What can be done in the way of operative interference to limit, if not entirely to prevent, the action of this predisposing cause to caries—this accumulation of food wedged up between the teeth by the “bite”? Much may be done, on the one hand, by contour fillings, and on the other hand by judiciously shaped spaces, the use of both methods being demanded by the varying conditions met with.

In dealing with “approximal cavities” one’s aim must be, so far as possible, to achieve three things :—

- (1). To prevent the recurrence of decay.
- (2). To render the tooth under treatment useful in mastication.
- (3). To protect the gum from irritation.

One of the first questions one asks oneself when an approximal cavity of any size presents itself for treatment, is whether or not to “contour” the filling to be inserted, and the answer

to the question often requires very nice discrimination as to the possibility of decay being prevented, mastication rendered more easy, and the gum protected better by contouring, or by permanent separation.

That "circumstances alter cases" is a very old proverb, but the truth it embodies is very frequently overlooked. Too often an operator gets into the way of following indiscriminately one method in all cases, either invariably "contouring," or invariably "separating," or worse still, he follows no method at all, simply filling his cavity flush from one wall to another without any regard to contour on the one hand or properly-shaped space on the other, and leaving, in consequence, as often as not, an irregular interval between the teeth, such as must inevitably produce rapid mischief.

Too often one meets with cases in which a diseased tooth has been treated—well enough, so far as the individual tooth is concerned, but without any regard to the relation it holds to its adjoining neighbours, to its antagonists in the opposite jaw, or to the gums and mouth as a whole.

Contour filling is desirable, nay, its use is imperatively called for, when by its employment one is able to achieve the three objects already referred to, *i.e.*, prevention of future decay, proper mastication, and protection of the gums.

Under what circumstances then, it behoves us to ask, does contour filling accomplish these things better than any other method of treating approximal cavities? The answer is simple, and it is this—when by contouring, the filling can be brought into *close* contact with the adjoining tooth. For, apart from the question of appearance—which we are not discussing now—the whole value of a contour filling lies in its knuckling up to the neighbouring tooth so as entirely to prevent the lodgment of food between the two neighbours, this lodgment being the fruitful source of recurrence of decay, irritation of the gums, and inability properly to masticate.

Contour filling is clearly called for, therefore, when the cavity to be treated is in a tooth standing so close to its neighbour as that a reasonable amount of contouring will restore the normal relation of the two. In the majority of instances this can be done, but the minority consists of not a few cases in which the diseased tooth stands so apart from its neighbour that a restoration of its normal contour does *not* restore the normal relation of the two teeth, that is to say, there is still a slight space left between them Under these

circumstances contour filling is bad practice, seeing that instead of preventing, it favours the retention of food between the teeth. Under these conditions, where the approximal space cannot be satisfactorily obliterated by contour filling, recourse must be had to the use of flat fillings and judicious shaping of the surfaces forming the mesial and distal walls of the space. Broadly speaking, this shaping (I am not speaking of front teeth) consists in making the walls boldly divergent, and very smooth and straight. Occasionally, when one's patient can be trusted to make diligent and constant use of quill tooth-picks and floss silk, the space may be made parallel-sided, and so a more extensive grinding surface retained; but as a rule the wedge-shape must be rigorously adhered to. Sometimes, in order at the same time to render the space as non-retentive, and to sacrifice as little tooth-substance as possible, the original space may be deliberately increased by means of gutta-percha or wool and mastic before finally shaping and filling.

With regard to the value of such spaces, it cannot, I think, be denied that, properly made and used only where contour work is inadmissible, they conduce to the comfort and safety of both teeth and gums. But it cannot be too strongly maintained that between full contour and wide space there is no middle course, a narrow, irregular space, especially if the walls are allowed in the least degree to converge at the masticating surface, being fatal both to comfort and health. It is by no means easy in every case to determine which to adopt—contour or space. Whilst striving to keep an open mind on the subject, free from undue bias in favour of one method or the other, I should for myself be inclined to say “when in doubt, play contour.”

Not infrequently one is called upon to deal with teeth the relation of which to their neighbours and to “the bite” calls for their restoration in contour, but in which disease is so very extensive as to render the wisdom of contour filling very questionable. In these cases the use of all-gold collar crowns is invaluable, or in the case of bicuspid, all gold, faced with porcelain. The particular advantage of this form of crown under the conditions named lies in the fact that it can be contoured out in any direction or to any extent, so that it knuckles tightly against the adjoining teeth, and antagonises exactly with its opponents; whilst the collar gives a security and finish which can be obtained by no other method, and

produces, if properly adjusted, no irritation of the gum after the day of infection. I may say that my own experience of crowning by this method has tended to show me that perfect adaptation of the collar can only be obtained by fitting it to the root in the mouth. I have no faith in the use of a model for fine fitting. And as to the modelling of the articulating surface, there is no question, to my mind, that the best way of producing a natural shape, and at the same time one that will articulate accurately with the opposing tooth or teeth, is by striking it up on a cast obtained from a wax model, built up and carved for each case, rather than by the use of the die-plates sold for the purpose, which make each crown a stereotyped inartistic copy of every other.

There are cases in which partial gold crowns, as they may be called, render excellent service in the preservation of badly-decayed teeth and the restoration of comfort in mastication. For example, the mesial half of a tooth may be sound and strong, whilst the distal portion, both approximal and coronal, may be the seat of extensive decay. The amount of sound tissue is such as to make one feel unwarranted in removing it for the sake of inserting a complete crown, whilst the carious cavity is so far-spreading as to make the security and durability of a large filling quite a question of chances. In such a case the contour of the tooth may be fully restored by the nice adjustment of a carefully modelled shell of fine gold, so made as closely to overlap the margins of the cavity. For a method of constructing these partial crowns which possess the essential qualities of rapidity and accuracy, I am indebted to my friend Mr. Gardiner.

II. *Irregularities of articulation, as productive of pathological conditions of the alveolo-dental periosteum.*

(1) Very familiar to all is the periosteal mischief set up by fillings insufficiently cut down to articulate accurately with antagonising teeth; and yet it would appear scarcely superfluous to emphasise the importance of due care in the modelling of masticating surfaces, judging by the negligence which is so often displayed in this respect. Where the upper and lower teeth deeply interlock it is sometimes quite surprising how great the indentation that is required on the surface of a filling to allow proper play for the tooth biting against it.

The inflammatory disturbance produced by a filling or an artificial crown left too high varies greatly in intensity. Occasionally periostitis fully pronounced is met with, the gum

surrounding the tooth being red and full, the tooth raised in its socket, freely moveable, and very tender to touch. But this is rare; the condition more frequently found being a state rather of irritation than inflammation, or if the latter, then of a sub-acute or chronic character. Tenderness in mastication is much complained of, and the contact of the tongue may be alleged to cause pain, whilst the gum remains normal, or almost normal in colour, and direct pressure exercised by finger or instrument elicit little or no suffering. A curious point about many of these cases is the complaint made of sensitiveness to thermal irritants, such as is generally characteristic of irritation of the pulp.

(2) There are similar cases, so far as symptoms go, in which the mischief is due, not to a badly-finished filling, but to a disagreement in the articulation of one or more teeth produced by the forward pressure of an erupting wisdom tooth. A patient presents himself with considerable periosteal discomfort, if not pain, in a first or second molar, or even a bicuspid. The tooth pointed out may be perfectly free from caries, and give little or no response to the usual tests for periostitis, and one may be disposed to seek for the source of pain as existing in some other tooth, or one may be inclined to look upon the irritation complained of as being a local and temporary manifestation of some constitutional condition. But if the tooth be tested by the use of articulating paper it will be seen that there is an undue amount of pressure exerted upon it by its antagonist, and it will be found on close examination that the teeth have been thrown out of gear, as it were, by the enormous pressure of a wisdom tooth behind them.

(3) In like manner the eruption of the second, and even the first permanent molars, in some few instances, produces similar results, the teeth complained of in the latter class of cases being the first molars themselves, which will be found to bite cusp to cusp, instead of cusp into depression.

(4) Yet again, just as the "bite" may be thrown out by newly erupting teeth, so it may be thrown out with similar results by the extraction of teeth. The extraction of one or more teeth leads sooner or later to more or less change in the articulation of the remaining teeth, and one may find periosteal irritation arising from this cause, although it is not common.

I need not dwell on the treatment to be adopted in all these

cases. It is sufficiently simple, and consists in nothing more than the use of corundrum wheels to ease undue pressure, indicated by means of articulating paper. Even in the worst cases it is rare indeed for this simple treatment not to be rapidly followed by complete comfort. The difficulty lies not in the operative procedure necessary to a cure, but in successful diagnosis of the cause of pain. It is of some assistance in obscure cases, to bear in mind that the pressure producing the irritation will be found almost invariably to be exercised on one small isolated spot.

III. *The "bite," as affecting certain modes of treatment adopted in the correction of irregularities.*

(1) Extraction, as a means *per se* for the treatment of irregularity.—This large subject I shall only deal with in a very limited way—to the extent, namely, of considering briefly the question of the removal of molars or bicuspidis for the relief of general overcrowding of the arch as a whole. There are those who argue—on paper—that extraction for this purpose is, in all but the most exceptional cases, to be utterly deprecated, that it is little short of criminal, in fact, to extract any tooth which in itself is not beyond saving; but I have yet to meet anyone entitled to respect as a practical man who can urge and prove that more good is done by the retention of the full number of teeth in a crowded mouth, than by judicious extraction. Theoretically, it is no doubt highly desirable to keep the dental arch intact, and sedulously to avoid any disturbance of a denture in which the teeth articulate normally; but it is not difficult to maintain, in the first place, that in crowded mouths the articulation is rarely quite normal, and is frequently much improved by extraction, and in the second place, that even where the "bite" is normal, the teeth may be so jostling one another, so weak in structure, and so extensively decayed, that it is far better practice to remove some of them bodily, even though by so doing one may disarrange the articulation and leave spaces which form receptacles for food, to the detriment of adjoining teeth, than to attempt to save every individual organ in the mouth of young patients often incapable of bearing extensive operations. I did not intend, however, to discuss fully the general question of extraction for the relief of crowded mouths; but taking for granted the wisdom of extraction when done with discrimination and due regard for the circumstances of each individual case, I wish for a few moments

to consider the more limited question as to which teeth one's choice should fall upon for removal.

As a matter of fact it is an almost universal practice to get rid of the four first molars. Generally speaking this is, I believe, a rational procedure in view of the facts that these teeth are very commonly the most prone to decay, and that their removal gives a larger amount of room than the loss of any other tooth does. But in a good many cases there are considerations, mainly concerned with the "bite," which contra-indicate the choice of the molar, and point to one of the bicuspid as the tooth to be sacrificed. These considerations are often overlooked, and in consequence the number of molars extracted is unduly swelled.

It ought never to be forgotten that the first molar is the chief grinding tooth. As a masticator it stands preeminent over the other teeth, its surface being usually larger than that of the other molars, and of course much larger than that of the bicuspid, whilst its position is uniquely favourable for the efficient and comfortable trituration of the food, it being far enough back to obtain powerful muscular assistance, and far enough forward to enable the tongue easily to keep large morsels of food between it and its antagonist. As far as its position is concerned, it may be urged that if extracted at the proper time the second molar takes its place, but this is only partially true, for though the second molar may come forward far enough to be in contact with the second bicuspid, its vertical axis is almost invariably tilted forward to some extent, so that it does not squarely antagonise with its opponent, the distal portions of the crowns alone coming into close apposition.

Bearing this in mind, and considering that the amount of space required in a crowded mouth is often not greater than the loss of four bicuspid will amply furnish, the comparative condition of molars and bicuspid ought to be most carefully examined and weighed at the time that extraction is decided on, and when it only remains to determine which tooth shall go. It will occasionally be found that the second bicuspid is in a worse condition than the molar, and it will often be found that its condition is nearly if not quite as bad, especially when it is remembered that the molar has had three or four more years of wear and tear than the smaller tooth. In these cases, providing that the molar is not so diseased but that it can be rendered a permanently useful tooth, the best course

to pursue is the extraction of the second bicuspid. In addition to the advantages of retaining the molar which have already been pointed out, it may further be noticed,—first, that the loss of a bicuspid in its stead gives more immediate relief to crowded incisors and canines; and second, that given a molar and bicuspid equally diseased, it is, as a rule, much easier to save satisfactorily the former than the latter.

Turning back now for a moment to those cases in which the loss of the first molars is fairly indicated, it is nevertheless generally of the utmost importance that these teeth should be patched up and kept comfortable, and the extraction if possible delayed until the second molars are quite erupted, and this for three reasons: first, that if the extraction is done at an earlier date the health of the patient is seriously endangered by inability to masticate properly; second, that the second molars tilt less the later the extraction of the others takes place; and third, that early extraction may injuriously affect the position of the incisors by leaving them and only partially erupted bicuspid to bear all the strain of the “bite.”

(2) “Raising the bite.” In those cases of irregularity where projecting incisors are kept in their abnormal position by the close contact of the lowers, it becomes necessary partially to “raise the bite,” that is, to induce, or allow of, growth upwards and downwards of the lower and upper posterior teeth respectively; so that the upper incisors, being relieved from the constant pressure keeping them out, may be brought into a better position.

The methods for accomplishing this vary in detail according to the circumstances of the individual case in hand, but a typical appliance for the purpose is a simple vulcanite plate made to cover the palate without capping any of the teeth. This being regularly worn for some time prevents the lower incisors from rising any more, their tips being made to impinge against vulcanite, whilst it allows of the molars lengthening. I have drawn attention to this class of case, because it is the “bite” of the lower incisors which, if not the original cause of the projection of the upper teeth, is the means by which it is maintained, and because unless close attention be paid to the “bite” generally throughout the conduct of such a case, its last state is likely to be at least as bad, and probably worse, than its first. For having, by means of the simple palate plate, obtained space between the

upper and lower incisors, and having inserted an appliance for the retraction of the uppers, it is necessary to take measures against the lowers rising again, and as they are always ready to do if left to themselves. If, for instance, the plate used in the retracting process is made to cap the molars, then it may be found that by the time the upper incisors have been brought into a normal position the lowers will have grown upwards, so that when the plate is out of the mouth they will forcibly press, as before, against the uppers. Therefore one ought, in such a case, to avoid capping the molars, in order to leave as little room as possible for the lower incisors to rise in.

In the correction of other forms of irregularity besides that just detailed, and in the use of retaining plates, it will often be manifest, if a careful study of the "bite" is made, that the articulation will suffer from prolonged capping, and this method of holding regulating plates in place ought therefore to be cautiously employed. Where there is difficulty in obtaining a firm hold for plates without capping, appliances attached firmly to one or more of the posterior teeth by means of snugly-fitting collars and oxy-phosphate cement prove very useful.

(3) "Jumping" the bite. This unscientific but useful term is applied to an operation which, when it can be accomplished, is a very pretty one, and one which helps very materially to improve certain mouths. By its means such a sudden alteration is made in the whole articulation as to justify the use of the word "jumping." Its peculiarity consists in this, that whilst every other regulating operation aims simply at altering the position of the teeth in relation to the jaw which carries them, this operation alters the relation between the jaws themselves—in other words, the bite is "jumped" by the lower jaw suddenly, in the course of a few days being made to close upon the upper in a manner entirely and markedly different to that in which it has been accustomed to close.

The operation is called for in cases where the upper incisors project, where the lowers bite far behind them, and where, besides these conditions, the bicuspids and molars inter-articulate abnormally, the lowers closing too far back, by the whole width of a tooth, the chin being consequently very retreating, and the facial expression weak and foolish. What has to be done here, if possible, independently of some retraction of the

upper incisors, is an alteration in the position of the lower jaw, so that the chin may be brought bodily forwards. This desirable end may be attained by various means. In a most interesting communication brought before the New York Odontological Society by Dr. Bogue and printed, with illustrations, in the *Dental Cosmos* of May, 1887, the bite was "jumped" simply by the expansion of the upper arch in the canine region. In this case it appeared that the distance between the upper canines—measured directly across the palate—being abnormally small, the lower teeth were simply unable to close in their proper position, and the whole lower jaw was kept back. The lowers biting as usual inside the uppers, but themselves forming an arch of normal width, the narrowness of the upper arch kept the lower back, so that when the former were expanded, the lower jaw as a whole, in the course of a few days, came forward and articulated in the usual manner with the upper. This result of expansion in the upper canine region was quite unexpected by the practitioner in charge of the case, the actual state of things being indeed not apparent to him until pointed out by Dr. Bogue.

A somewhat similar case, at least in its unexpectedness and rapidity, occurred in my own practice. Having drawn back some prominent upper incisors in a case with a markedly retreating chin, and desiring to keep them in position, I attached a retaining wire to gold caps made to fit the second upper bicuspid—the first molars being gone and the second scarcely long enough to furnish a secure hold. In order to prevent the bicuspid themselves being brought forward, instead of the incisors being held back, I furnished the caps with tiny inclined planes, directed downwards and backwards for the lower bicuspid to bite against. In a week's time I saw the patient, and was not a little pleased to find, that not only had the end I had in view been accomplished, but the lower jaw had come right forward by the width of a tooth, and the retreating chin offended one's eye no longer.

It may be observed in both these cases, but particularly in the first, that the movement of the lower teeth was due, not to any active mechanical interference with them, but to a spontaneous action on the part of the lower maxilla, when once it was set free from the abnormal position that it was locked in by the bite.

Mr. President and Gentlemen, in bringing my remarks to a conclusion I feel that, while I have occupied quite enough

of your time, I have put your patience severely to the proof in bringing before you such well-worn topics. I fear that the somewhat ambiguous and pretentious title of my paper may have raised expectations that have been disappointed. I am sure that such a heterogeneous collection of notes strung together by so slender a thread as I have used, is scarcely worthy to be offered to this Society, and I can only selfishly hope in leaving its inadequacies to your generous consideration that I at least may gain something from the wealth of experience and opinion which the very poverty of my paper may possibly call forth in discussion.

THE DEVELOPMENT, FORMS, STRUCTURE, AND MODES OF ATTACHMENT OF TEETH, HUMAN AND COMPARATIVE.*

By JOHN W. DUNKERLEY, Esq., L.D.S.I.

Mr. President and Gentlemen :—

I hope by the aid of the Oxy-hydrogen lantern, to make what is really a dry subject, an interesting one.

Life, we all know, commences as a single nucleated cell, called the ovum. The first result of the fertilization of the ovum is a cleavage into two distinct parts, these again divide into four, then into eight, and so the sub-division goes on until at length a great number of nucleated cells are formed. Although these cells descend from a common protoplasmic mass, they have the power, or tendency, to produce certain parts by differentiation, and they undergo certain modifications and become bone-cells, &c. And, again, these special cells, by their division and sub-division, cause an enlargement of the whole bulk, and form the various parts of the frame and organ; so that we ultimately get a perfectly developed animal. Man himself was formed in the same way and manner by the actual conversion of certain cells. And in this process of development, we get a special structure which forms the teeth.

The teeth of the human subject afford but a very limited and imperfect idea of these organs throughout the animal kingdom. In Comparative Anatomy, although the teeth are

* Delivered before the Manchester Odontological Society.

more or less formed in the same way, we have quite a diversity in their number, form, size and structure. In number, we have them varying from the countless teeth in some fishes to the solitary tooth in the Narwhal. In position, we have them not confined to the maxillary arch as in man ; but, as in fishes and reptiles, they may be found on the palatine, vomer, and lingual bones ; more rarely on the pterygoid, the sphenoid, and on the branchial arches ; and if we include the lower animals we find teeth, or organs corresponding to them, situated even in the stomach. In form, we have them infinitely diversified, from the simple flat-plates, in some of the ray fishes, to the elephant's tusk.

The teeth of the vertebrata, fishes, reptiles, and mammals, although they present considerable variety among themselves, are all more or less of the same character ; and are modifications of a cone in their form. They are always situated in, or in the neighbourhood of, the mouth. The varieties which they present throughout the range of the animal kingdom, correspond to the infinite diversities in the functions they are required to perform ; and so perfect are the adaptations which they present in various animals to their wants and instincts that, from their peculiar formation, they indicate exactly the type of animal to which they belong ; and thus teeth are found to furnish the best characteristic marks by which we may classify the members of the animal kingdom. The simplest forms of teeth are such as are met with in some fishes. In the skate and several allied species they consist of flat plates of bone, covering the interior of the mouth like a pavement. The first indication of a conical, or pointed form of tooth, may frequently be found occurring in such a pavement by some of its flat plates becoming prominent at the centre. This tendency to cone-shaped teeth continues until they present a very high degree of development, as seen in such examples as the pike, with its array of strong recurved and pointed blades, and some sharks with their remarkable dental system, composed of tier upon tier of teeth all round the jaws, an arrangement well adapted to the savage nature and voracious habit of these creatures.

Among reptiles we find some remarkable forms of teeth, showing further developments of the cone. Some of these animals, such as turtles and tortoises, have no teeth, but a horny covering extended over the jaws. Frogs have only

upper teeth ; while some serpents have teeth, not only in both jaws, but also situated upon the palate.

In the Mammalia, the teeth are confined to the upper and lower maxillary, and in most instances are renewed only once during lifetime. But in some animals no renewal, or second series of teeth, is provided, as in dolphins, armadillos, and sloths. So that if a tooth is lost, it is never replaced.

Another peculiarity of teeth among some of the Mammalia is that of continuous and uninterrupted growth. This is seen in the incisors of rodents, in the molars of sloths, in the tusks of the elephants, and similar examples. The reason of such a development is that, as the tooth is being worn down at its point, it continues constantly growing at its base, thus replacing that which was lost ; and so persistent and certain is the occurrence of this growth that, in cases where the abrasion of the tooth becomes arrested, it goes on increasing in length until it becomes not only an inconvenience, but sometimes by impeding the motion of the jaws, leading to starvation.

The teeth in the Mammalia may, in a general way, be classified into those of carnivora and herbivora, and those partaking more or less the characters of both, as in the omnivorous animals, such as man. Of the carnivorous order, the Lion may be selected as illustrating all those characters of a dental system perfectly adapted for a flesh feeding animal. The ox may be taken as affording a well marked example, of the herbivora ; and in the Omnivorous, we are more or less acquainted with ourselves.

Having thus briefly given an outline of the different characters of the teeth, I shall now proceed to more fully describe the plates, as they are thrown on to the screen.

Plates 1. The human skull. Here we have teeth which are a type of beauty. For in man when teeth are perfect in form, number, and structure, they added greatly to the perfections of the features. They are also subservient to his highly perfected mode of speech. We are so well acquainted with the teeth of man that I need not describe them.

Plate 2. This is the skull of a Gorilla (*Troglodytes*) and certainly we could not call it a type of beauty. Although in other respects, the gorilla approaches very nearly to man, this cannot be said to be the case with its dentition, although the dental formula is the same. I may here say that the chimpanzee comes nearest to man in its dentition. The jaws of the gorilla are very square, and the median incisors of the

superior maxillary are of unusual size, and are of very great strength, being double the size of the lateral incisors, which are more pointed. There is also a large diastema in front of the superior canines. These teeth denote the sex, being very much larger and stronger in the male than in the female, and serves the animal as a powerful weapon when fighting with his rivals. When the mouth of the male is shut the superior canines are below the level of the alveolar border of the lower maxillary. In the lower jaw there is no diastema and the teeth are all in contact with each other. The cusps of the first premolar are very strong pointed cones; the molars increase in size, the second being larger than the first, and the third molar is the largest of all. The teeth are also coarser and much stronger than in man. The microscopic structure of these teeth closely resemble that of man, and shew in transverse sections the striated appearance of the cellular origin as distinctly as in the human tooth, although the enamel fibres are more wavy, and are $\frac{1}{8000}$ of an inch in thickness. The dentine tubes shew the same primary curvatures, but less strongly; and nearer the enamel the interspaces are wider, though in the bulk of the tooth they are more closely arranged and are more numerous, and straighter than in the human subject.

Plate 3. Monodon. In the narwhal there are only two teeth; at all events, every other trace of teeth is lost.

The two persistent germs rapidly elongate: but internally rather than externally; thus first forming in appearance a long fang instead of a crown. Each tooth is buried in the horizontal alveolus of the interand maxillary bones; and by the forward growth of these bones soon becomes entirely inclosed. In the female narwhal, the pulp is here exhausted, further development is arrested, the cavity of the young tooth is obliterated by its ossification, and the two teeth remain embedded in the substance of the bone. They attain to a length of between 8 and 9 inches. In the male, the left tooth continues to enlarge from a persistent pulp, and the pulp material is progressively added; which, by its calcification, elongates the base; and this forces the apex from the socket, and the tooth continues to develop until it attains the length of 10 or 12 feet, having a basal diameter of 4 inches.

The tooth is perfectly straight, but is marked by spiral ridges, winding from right to left. About 14 inches of the tusk is implanted in the socket, and it tapers gradually from the base to the apex. The pulp cavity is of various widths.

At the base it forms a short and wide cone, and is then continued forwards as a narrow canal along the centre of the implanted tooth, beyond which, the cavity again expands to half the diameter of the tooth; and then gradually contracts again until it is a mere fissure near the apex. The substance of the tooth in the narwhal consists of modified dentine covered by cement.

The small abortive tooth on the right side of the mouth has a few slight longitudinal indentations on its basal half, and is smooth on the rest of its exterior. It is solid, and is closed by a bulbous accumulation of cement at its base, which is more or less indented. The apex is a blunt and rough prominence. The ordinary length of this tooth is the same as the abortive teeth in the female.

Plate 4. Skull of Leo, which is a type of power. The dentition of the cat genus (*felis*) may be recognized as the most typical of the order carnivora, not only from its formidable simplicity and peculiar adaptation to the destruction of living animals and the mastication of their flesh, but because it is a link between the transitory dentitions of all the other digitigrade families and genera more or less closely approximate. The feline formula. is Incisors $\frac{3}{3}$ $\frac{3}{3}$, Canines $\frac{1}{1}$ $\frac{1}{1}$, premolars $\frac{3}{3}$ $\frac{3}{3}$ Molars $\frac{1}{1}$ -28. The six incisors in both jaws are closely arranged with their crowns in a transverse line; their fangs are zigzag, at least in the lower jaw. The outer incisor of the upper jaw is conical, with a sharp ridge on the outer side, with a small tubercle on the inner side, in which the posterior ridge terminates. The smaller intermediate incisors have broad and thick crowns, which are indented by a transverse cleft, and the posterior ridge so defined is sub-divided by a minute vertical notch, which is soon worn away. The lower incisors are smaller, especially the outer pair, which have an external basal tubercle, and not the posterior ridge. The canines are very large and strong, with fangs thicker and longer than the enamelled crown. This is conical, sub-compressed, and slightly recurved. Its point is sharp and convex anteriorly and externally. but somewhat less so internally. It is almost flat in the lower canines; and both the labial and lingual surfaces are indented with one or two parallel longitudinal grooves, which are characteristic of the canines of the typical Felidæ. The first upper premolar is a very small tooth with an obtuse conical crown, and has a single fang; the 2nd premolar is much larger in size, and has a sub-compressed conical crown with a posterior basal tubercle,

and a small anterior prominence. It has two very strong diverging fangs. The 3rd upper premolar is really the fourth premolar, as the first premolar proper is missing in the Felidæ. This is the sectorial tooth, and its extensive blade is divided into three lobes by two angular notches. The first and second lobes are conical; and the second lobe is the largest, its point inclining backwards, with an obtuse ridge continued from its inner side to the base of the internal tubercle. The third lobe is that on the inner side of the blade, and has a horizontal sinuous edge. The internal basal tubercle is developed from the interspace between the first and second lobes of the blade. This tooth has three fangs, the two anterior ones being on the same transverse line. The true molar in the upper jaw is very small. In the lower jaw, the first premolar has an anterior and posterior basal tubercle and is held firm by two fangs. The second premolar is larger, and has two posterior tubercles. The true molar has a crown which consists of a very sharp blade, divided into two equal, with compressed, pointed lobes. This tooth is supplied with two fangs, the anterior being very much larger than the posterior.

Plate 5. *Hyæna (Crogneta)*. The dentition of this animal presents a difference between the Canidæ and Felidæ, and approaches nearer to the strictly carnivorous type by the reduction of the molars to a single minute tooth on each side of the upper and lower jaw. The premolars and the molar of the lower jaw are all conical in form, and the molar teeth in both jaws are larger and stronger. The canines are much smaller than in the feline species. The formula is: In. $\frac{3}{3}$; C $\frac{1}{1}$; Pm. $\frac{4}{4}$; M. $\frac{1}{1}$; = 34.

The normal dental formula of the genus *Canis* is: In. $\frac{3}{3}$; C $\frac{1}{1}$; Pm. $\frac{4}{4}$; M. $\frac{2}{2}$; = 42. In no order are the jaws so well armed with dental organs as in the canis. The vacancies are only sufficient to allow the interlocking of the canines, which are strong and formidable weapons for seizing and slaying its prey. The incisors are well adapted for biting and gnawing; the premolars are made for cutting and dividing the fibres of animal tissue, and the true molars are well adapted for cracking, crushing, and completing the comminution of the food, whether animal or vegetable. The enamel of the carnivora teeth is extremely dense and brittle, with dentinal fibres similar to those in human teeth, (except that they are smaller and more compact) and the transverse striæ are less marked.

Plate 6. Skull and head of Musk Deer. (*Moschus Moschiferus*.) The ordinary dental formula of the ruminanta is : In. $\frac{0}{3}$; C. $\frac{0}{1}$; Pm. $\frac{3}{3}$; M. $\frac{3}{3}$; = 32. All the hollow horned ruminants, such as antelopes, sheep, and the ox, and many of the deer tribe which have solid horns, have this formula. The exceptions have canine teeth in the upper jaw, but are hornless. In the male Musk Deer, the upper canines are very long, and protrude like tusks beyond the lips, descending beyond the lower maxillary. These teeth denote the sex, and are used for fighting and defence. The female also has canine teeth, but they are very small. The lower incisors, in both sexes, instead of being antagonized with teeth, close upon a dense gum which clothes the front part of The upper jaw : the premolars and molars consist of an inter-blending of the dental tissues in the crown, whereby they are made more useful for the mastication of vegetable substances. The upper premolars are implanted by means of three fangs, two buccal and one palatine ; and the upper molars by four fangs, two outer and two inner. In the lower jaw both premolars and molars are implanted by two fangs. The crowns extend into the sockets before dividing into fangs, which increase in length with the age of the ruminant. The microscopic structure of the separate tissues, differs little from that of the mammalia. In the dentine of the incisors a few vascular canals are found and the cement of the molars are very thick, and contains vascular canals. In old teeth the pulp is converted into osteo-dentine.

Plate 8. Walrus. (*Trichechus Rosmarus*.) In very young animals, there are three teeth in each intermaxillary bone, and two on each side of the front part of the lower jaw ; and only the outer pair in the superior maxillary are retained, the others being shed without being replaced. The upper canine at first pushes in between the incisors, but when fully developed the incisors lie behind the canines, (i.e. lingual side) instead of being in the usual position of these teeth ; and being small and similar in form to the molars, which they closely resemble, might be taken for such a tooth. There are three molars on each side in the upper jaw, behind the permanent incisor ; and four similar teeth on each side of the lower jaw. The first tooth passes into the space between the upper incisor and the first molar. The crowns of the molars are very short and are level with the gums, and the molars of the lower jaw are smaller than the upper ones. Canines are

only developed in the upper jaw, and are found in both sexes of the same size. They are of enormous length, descending and projecting from the mouth like tusks, curving outwards and then bending backwards. These teeth are persistent in growth. The food of the walrus consists of sea-weed and bivalves; and the molars are well adapted to break and crush shells, while the canines serve as weapons of offence and defence, and also aid the animal in mounting and clambering over slippery blocks of ice. Their teeth are capped with enamel which is soon worn off, when both the tusks and the molars are protected by a very thick coat of cement. The dentine describes very strong and irregular curves on leaving the pulp cavity. In the molars the tubes send from both sides extremely numerous short branches which curve transversely across the interspaces; the interspaces between the tubes are about of $\frac{1}{8000}$ an inch in width. The tubes at their extremities are rich in tufts of curved branches, which terminate in a layer of minute cells in the crown. In the canines the lateral branches terminate in minute opaque cells dispersed throughout the whole of the dentine, and a third part of the periphery of the canine is composed of true dentine, where it is defined by a distinct layer of these cells. The central part of the tooth is filled up by osteo-dentine. The pulps when forming osteo-dentine form numerous distinct centres, which are usually hollow. These cavities are connected together and also with the pulp cavity by medullary canals. The calcigerous tubes radiate from these central cavities in all directions, dividing and sub-dividing and sending off numerous branches, which anastomose with those of adjoining masses, and where near to the dentine anastomose with the tubes thereof. The pulp cavities of the incisors and molar teeth are also filled with osteo-dentine and minute vascular canals which convey the capillary blood vessels to this structure from the vascular membrane attached to the base of the teeth; and in the tusks, from the persistent pulps which fills the large basal cavity.

In regard to the human teeth, we are pretty well acquainted, with their development; but I wish to throw on to the screen a drawing and also a micro-photograph of the development of the human enamel.

(To be continued.)

British Journal of Dental Science

LONDON, DEC. 15th, 1890.

THE MORTMAIN ACTS.

AMONG other questions, which it is proposed to bring before the Select Committee on Hospitals, when it again meets, is that of the Mortmain Acts. With dental hospitals springing up around us, not only in town, but also in the provinces, these affect our speciality equally with its parents, medicine and surgery. It is not, we believe, generally known that not only are bequests of land to charitable objects illegal, but also that clauses in wills which direct money to be raised on land, either by selling it at once or by mortgages thereon, are null and void ; in short, any money which has been invested, either directly or indirectly, on the security of land, cannot be bequeathed to a charity. As examples we may mention Local Government Loans, Metropolitan Consolidated Stock, money secured on Railway, Canal and Dock dues, these and many others come within the meaning of "realities" and as such are included. This is none the less true because there are exceptions, thus the Acts do not apply to property situated in Scotland, Ireland, the Colonies or abroad, land within the City of London can be so bequeathed by a freeman of the City, and certain bodies have clauses in their charters of incorporation which exempt from the working of the Acts, of these, we may mention the Universities of Oxford, Cambridge and Durham, and the Victoria University, St. George's, Middlesex, and University College Hospitals. Mr. Ernest Hart, has collected much information as to the injurious working of the Act, and states that even such an ancient institution as Guy's Hospital informed him, that people inquire of them "whether they can receive bequests of certain kinds—say, moneys secured on mortgage of municipal rates—and they are compelled to refuse." To give an illustration of how the Acts work.

Warneford Hospital at Leamington, was recently left by will £500 ; the "pure personality," however, did not amount to sufficient to pay this and the bequests to other charities, and as money could not be raised on "real estate," for the purpose of making up the deficit, the hospital lost half the legacy. The origin of these Acts takes us back to very ancient times. even to then when land was held in fief from the feudal lords, these being in their turn answerable to the King. Land, thus, was paid for by the direct service of its holder in one form or another, the defence of the country depending on such service, Ecclesiastical corporations, whose centre lay at Rome, did not yield this service, hence, there was direct loss to the Crown, and hence the Mortmain Acts. Gradually, however, as the lords became absolute owners of the land, ceasing to give anything in exchange, it is apparent that the reason for the Acts dropped, nevertheless, they continued in force, and were renewed from time to time. The view taken by the legislators shifted ground, they held that it was unwise to allow land to accumulate in the hands of bodies with perpetual succession. We do not know that it necessarily follows that because land was bequeathed to such bodies that, therefore, they would continue to hold it in perpetuity ; anyway, it would be very easy to guard against this, if thought desirable, by insisting that such land should be at once sold. It must be apparent from the foregoing that charities actually lose money which it was the intention of the testator should be theirs. We have little sympathy with men or women who bequeath money to charities and ignore the nearer claims of poor relatives, or who, perhaps, having spent parsimonious lives, and then, not being able to take their money with them, leave it to some "charity" in the hope that the "Recording Angel" will enter it to their credit account. There are, however, many who deserve the title of "charitable," who of an abundance, or having no nearer claims, leave money to "charities" they have possibly been good supporters of, during their lives, and we can see neither rhyme nor reason why their good intentions should be rendered null and void.

Abstracts of British & Foreign Journals.

TO PREVENT THE FORWARD MOVEMENT OF THE LOWER JAW WHEN TAKING A BITE.—I combine two old methods, and do not see how anything could be better, as follows: Direct the patient to exert the force in closing that he would do if crushing something between the molar teeth or extreme back parts of the mouth on both sides at once, and also at the same moment swallow or perform what some writers call “empty deglutition.” I am aware that some practitioners will claim that they have tried this plan and found it a failure. If so, the fault was not in the method but in the operator. It requires very great care to always preserve and accurately apply to use even a correct “bite”; and there is no doubt that the patient is often blamed when the fault was entirely with the dentist. If a piece of wood is buried in the wax to arrest closure at a certain point, the soft, yielding gums or ridges may be greatly depressed at that point, so that when the correctly shaped cast is placed in the “bite” it cannot go to its proper place until the points over or at the wood are cut away so as to allow the cast to go to the right place. While it may be that this is not the *best* method, if rightly applied there is no need of a better one.—W. E. DRISCOLL.

Cosmos.

IRREGULARITIES IN THE ARRANGEMENT OF THE PERMANENT TEETH.

DR. E. S. TALBOT.

AT the age of six years, the temporary teeth and the first permanent molars are in their places in the jaw. By removing the outer plate of bone in the jaw, it will be seen that the germs of the permanent teeth are in their crypts. While the teeth grow independently of the alveolar processes, the processes depend, to a great degree, on the teeth for development. With these various conditions existing at the same time, it is not surprising that the teeth are erupted out of normal position.

The alveolar processes are, to an extent, independent of the jaws. The parts below the mental foramen on the lower jaw,

and above the palate on the upper jaw, are hard and dense, and are for the attachment of muscles. The alveolar processes, composed of soft and yielding tissue, are expressly for the purpose of the formation of the teeth while in the crypts, and for their retention after they have erupted. When teeth are removed, the processes are absorbed, and nothing remains in old age but the dense bone.

In intra-uterine life, while the teeth are forming, the alveolar processes cover and protect the crypts in which the germs are located, and, as they grow and force their way through the processes, absorption takes place and most of the bone vanishes. After they have passed through, deposition of bone again takes place for the purpose of holding them firmly in place. Again, these teeth are shed and bone is absorbed to admit the second set of teeth, after which new material is deposited for their retention. This is the case under all conditions of their eruption, whether regular or irregular. From the time teeth appear till the second set are fixed in position, the alveolar process has changed three times ; consequently, while the teeth grow and develop independently of the alveolar process, the processes are, to an extent, dependent on the teeth for their development, position, and shape.

The permanent teeth, take the place of the temporary, and are likely to be deflected in any direction by the slightest obstruction or want of space, are, indeed, "creatures of circumstances."

Mr. Tomes says : "The point on which it is impossible to insist too strongly is that the teeth, when they are erupted, do not come down and take their places in a bone already prepared for them ; on the contrary, that which is there to start with is absorbed, and the bone in which they are ultimately implanted is built up around them, whatever position they assume subsequent to their eruption." The size of the jaw does not indicate the size of the alveolar process. The teeth may erupt toward the inner border of the jaw, when process will build up about them, and will be smaller than the jaw ; while the teeth may be directed outward, and, as a result, the process will be larger than the jaw.

In whatever position the teeth make their appearance in the jaw, the cheeks and lips add materially in directing their position externally, and the tongue internally. The order in which they are erupted may have as much to do with the

causation of irregularities as any one thing. This is particularly noticeable when the bicuspid and lateral incisors come down in close proximity, and the cuspids are left outside the arch, or when the centrals, the laterals and cuspids are in place, and some of the bicuspid, which have been retarded in their eruption, are forced abnormally inward. Lateral incisors and wisdom teeth are rather frequently out of position, since their tardy development allows the other teeth to occupy the space.

It will be observed that the crowns of the permanent centrals, on the lower jaw, are situated below, and posterior to the roots of the temporary teeth. The permanent crowns, being larger and requiring more space, naturally crowd outward and conflict with the roots of the temporary teeth, this producing absorption of the entire root. The roots of the temporary teeth may be all removed by nature in this same way. If the crowns of the permanent teeth do not come in contact with the roots of the temporary teeth, or if from any cause the pulps of the deciduous teeth are destroyed, absorption does not occur to any extent, and the roots are not removed. The permanent teeth are then deflected either into the mouth or out toward the labial or buccal surfaces, or they remain embedded in the jaws.

When temporary teeth are extracted on account of decay, or to make room for the permanent teeth, the cavity occasioned by such extraction fills up with osseous deposit, which deflects the permanent teeth outward or inward, since the tooth cannot penetrate it.—*Irregularities of the Teeth.*

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, November 3rd, 1890. Mr. Felix Weiss, L.D.S., President in the chair.

The minutes of the preceding meeting having been read and confirmed,

Messrs. J. F. COLYER, M.R.C.S., L.R.C.P., L.D.S. Eng., and G. W. BATEMAN, L.D.S., signed the Obligation Book and were admitted Members of the Society.

Mr. J. H. BADCOCK, 140, Harley Street, W., was nominated for membership.

The LIBRARIAN (Mr. ASHLEY GIBBINGS) reported the receipt of the new edition of Mr. Henry Sewill's "Dental Surgery," as also the reports of various scientific Societies, including the Smithsonian Report for 1886-7, the Proceedings of the Royal Dublin Society, the Proceedings of the Royal Society, *Quarterly Journal of Microscopical Science*, and the Calender of the Royal College of Surgeons; also, a drawing of the trigeminal nerve and chart from Mr. Michael Lister.

The CURATOR (Mr. STORER BENNETT) stated that a student of the Dental Hospital (Mr. A. H. Farebrother) had presented the skull of an African bushman, the especial point of interest being the socket for a third upper incisor on the right side. Mr. Ackery had presented a series of models showing absence of one or more lower incisors. Mr. R. H. Woodhouse had presented a necklace composed of thirty-four human teeth, which he had received from Mr. H. M. Stanley, accompanied by a description, of which the following is a copy:—

"October 19th, 1890.

"This necklace of native African teeth was worn by a native of Avisibba, on the Ituri River, about 1,550 miles inland from the mouth of the Congo River. He was one of the party that had lain in ambush at the confluence of the Ruku and Ituri. On examining the dead a warrior was found with a necklace of human teeth around his neck. It was carried away as a small evidence of the propensities of the cannibals. Among non man-eating tribes such an ornament would be considered horrible. Others of the same tribe wear monkey and crocodile teeth. On one occasion I saw one wearing a number of human teeth equal to ten necklaces of this kind, or between 300 and 400 teeth strung thickly together."

A humorous sketch had also been received, the gift of Mr. William Merson, of Bournemouth, which depicted a tooth being extracted in the "good old times."

The PRESIDENT, referring to Mr. Farebrother's specimen, thought the frontal elevation of the skull rather higher than one would expect in a bushman; it seemed to him to suggest the possibility of European origin.

Mr. ROBERT H. WOODHOUSE in presenting the necklace

referred to above, remarked that it had been brought from Central Africa by the Emin Pasha Relief Expedition. It had been taken from the neck of a native killed in the skirmish in which Lieutenant Stairs was wounded, and consisted of thirty four teeth, two of them being temporary ; one, a lower wisdom tooth, gave evidence of extensive caries. The teeth were obtained by the natives by burning the skull. The single-fanged ones were pulled out, and the others were broken out, apparently with considerable violence. Mr. Woodhouse mentioned that he had been anxious to obtain some skulls from Africa from Mr. Stanley, and asked him particularly if he had any pigmies' skulls. Mr. Stanley replied that he had only brought home two, and these had been sent to the Natural History Department of the British Museum, South Kensington. Mr. Woodhouse stated that Mr. Stanley had told him that in one place there were on each side of the road, in the position of the kerbstone in our streets, continuous rows half a mile in length, of skulls, the owners of which had all died a violent death. He had been rather surprised to hear from Mr. Stanley how great an amount of caries existed in the teeth of the native Africans ; the great explorer mentioned that he and his subordinates were called upon to extract some 400 or 500 teeth. The teeth in the necklace came from a region never hitherto reached by a white man. The caries of which he had spoken existed amongst the tribes of the extreme Western and extreme Eastern coasts, which had doubtless been in contact with some form of civilization for some hundreds of years.

The PRESIDENT remarked that they were very much obliged to Mr. Woodhouse for the necklace, more particularly as it was accompanied by a letter from a man of such large experience as Mr. Stanley. He added that he had been told that it was quite a common thing among savage tribes for the victors to extract all the teeth of the slain and wear them as a kind of trophy.

Mr. C. V. COTTERELL showed and explained a small device which he had designed, and had been using for some time, the object of which was to keep the rubber dam from the nose. In filling anterior cavities he had found it of great advantage. In several cases he had noticed the gold had a tendency to peel or not to adhere, and it occurred to him that this was due to the breath of the patient. This nose-guard enabled

the rubber dam to be placed on the nose without impeding respiration.

Mr. J. ACKERY referred to a case of "absence of lower incisors," reported by himself some two or three months previously, when he had stated that these cases were very rare. His object in alluding to the subject now was to modify the statement, which it seemed was not strictly true. The gentleman who first pointed out to him that such a condition is not very rare had been kind enough to show him several similar models, and some of them were on the table: (1) a case in which the two incisors were missing in both upper and lower jaw; (2) two cases in which the two lower incisors were missing; (3) one lower incisor missing from the temporary dentition.

He also had a model showing extensive erosion, or abrasion of incisor, canine and bicuspid teeth, which he thought would be interesting. The condition was not in any sense due to the attrition of the lower teeth, because the distance between the anterior upper and lower teeth was three-eighths of an inch when the jaws were closed. The patient was a male, aged thirty-five years. The mouth might be considered a distinctly clean mouth. The patient was not in the habit of using a hard brush. With this model Mr. Ackery passed round a model of the mouth of a brother of the patient, showing erosion in the most natural position, viz., the lower incisors; the dentine had suffered if possible, more than the enamel. In connection with this he also passed round a pair of lower teeth when he had extracted from a man aged fifty-six, showing erosion on the lingual surface.

Mr. R. A. WOODHOUSE wished to ask Mr. Ackery if these teeth were at all sensitive; he had indeed noticed three or four cases in which patients had come to him suffering obscure pain, and on examination he had found that there had been a nerve exposed from the attrition of the teeth. He did not gather from Mr. Ackery's remarks whether the patient had suffered any severe pain or not.

Mr. JAMES STOCKEN stated that a short time ago he had a case under observation in which the labial surfaces of the incisor teeth were uniformly eroded, and in this case there was no sensitiveness, though the erosion had gone so far as to produce quite a knife-like edge. In one or two cases he had tested the saliva and had found it decidedly acid.

Mr. J. ACKERY, in reply, said that in this case there was

absolutely no sensitiveness of the teeth. The patient did not complain of any, and when questioned on the subject did not even seem to regard the condition of his teeth as in any way peculiar. It would be noticed that he had lost the *first* upper right molar, whereas the tooth he consulted Mr. Ackery about was the *second* upper right molar.

The PRESIDENT then called on Mr. Matheson to read his paper. [See page 1105].

DISCUSSION.

Mr. ASHLEY GIBBINGS desired to ask Mr. Matheson if he had seen any jumping of the bite resulting from the extraction of six-year-old molars. He had a case in hand in which the history showed that before the first molar was extracted the bite was normal. After extraction the lower jaw commenced to move forward and to one side. The patient was now using an apparatus capping the molars with an inclined plane so as to hold the jaw back and move it to the right side. The girl was now over fifteen years of age, and Mr. Gibbings was glad to say the bite had improved immensely. The upper canine was now behind, whereas before it was one-sixth of an inch in front of the lower canine.

Mr. WALTER H. COFFIN thought with regard to jumping of the bite, that the cases were very exceptional in which it took place to the extent of the whole width of a tooth. In many cases a jumping of the bite could occur without necessitating a movement of the teeth or jaw to this extent. When teeth are biting in one place normally, and abnormally or on the cusps in another place, a judicious extraction might produce what might be termed a partial jumping of the bite, resulting in a perfect articulation of the jaws.

Mr. JAMES STOCKEN was quite satisfied that it was wrong to extract the six-year-old molar before the twelve-year-old molar had developed; if that was done a tilting resulted. He had only just received a case which was fairly represented by Mr. Matheson's diagrams. The lower jaw was projecting at least half an inch. He could not help thinking that the treatment of jumping was in this case just the one he should adopt.

Mr. STORER BENNETT, being called upon by the President for his paper, said that he would very willingly defer it in order that Mr. Matheson's important paper might be fully discussed.

Mr. WILLIAM HERN said there were two points to which he desired to draw attention. First, with regard to contour fillings: the gist of Mr. Matheson's advocacy was *for* contouring; when, however, a cavity was suitable for a contour filling it would be advisable to get a previous separation of the teeth, which would give room for knuckling back; as soon as the tooth was filled it would knuckle back to its position. Without a previous separation the tooth would be a constant source of annoyance to the patient. With reference to the jumping of the bite, both those cases mentioned had been where the lower jaw had come forward easily. Cases in which patients deliberately protruded the jaw would be known to everyone, and it should be borne in mind that it was almost impossible to retract it. The lower teeth would come forward in a very short space of time, and the glenoid cavity would adapt itself to a forward, while it would not adapt itself to a backward, movement.

Mr. WALTER H. COFFIN asked when an approximal cavity presented itself, and there was hesitation as to whether a permanent separation (flat or wedged) or contour filling should be adopted, he would like to know if Mr. Matheson had tried the method of inserting what was known as a "chewing bar." This bar was inserted between approximal cavities with a view of affording protection to the gum. He had seen cases of several years' standing where patients had expressed the greatest satisfaction with this method, but he had not himself had the courage or the audacity to adopt it.

Mr. C. ROBINS remarked that he had been brought up to believe flat fillings and V-shaped spaces between the teeth were very unorthodox, and until about eighteen months ago he had only adopted them with great caution. He was very glad to hear Mr. Matheson clear these points up. Where the contour had to be exaggerated, of the two methods he preferred the V-shaped spaces, opening a little wider on the lingual than on the buccal aspect. He would like to say one word in reference to jumping the bite. He had just had a case in which the patient was fifteen or sixteen. The mother urged him to push out an instanding lateral, which he did, partially by expanding the arch. He got the teeth into a pretty position, but to his dismay the lateral would keep going in. This he afterwards found was due to a cusp-to-cusp bite opening the mouth, and so prevented any lower tooth from keeping the lateral in its proper position, but a

little grinding with stones made the occlusion perfect.

Mr. FIELD said, with reference to contouring, ought they not to ask themselves the question, "What do we understand by contouring? Is it to restore the tooth to its normal contour? or is it to close up these large spaces?" If it were to restore the normal contour, he might say he had not seen cases which were prejudicial, perhaps with one exception, viz., those cases of unclean mouths, and here neither flat filling nor contouring is successful. In all cases he should incline to contouring to give the best results. In regard to the chewing bar, he might give his own experience: patients were delighted with it as an aid to mastication, but he had seen very poor general results from its use. It necessitated too much destruction of good tooth substance, and without great care on the part of the patient the cervical margin of the tooth was apt to be undermined. The teeth were injured when the other end of the bar was put on by a cap, and when it was put in by a mortice, movement took place which loosened it.

Mr. LEONARD MATHESON in reply said, in reference to Mr. Gibbings' remarks, it would seem as if possibly his case might have been one of those in which the premature extraction of the first molar did the harm. He would like to know from Mr. Gibbings if the second molars had come through at the time when the patient was eleven years of age? He should imagine not. If not it was probably due to the premature extraction to which he had alluded. The lower incisors easily thrust themselves forward and push the upper incisors out. As regards jumping, he quite admitted, and gladly admitted, that there was a partial as well as a complete jumping of the bite. The two instances he mentioned were only given as striking examples of what might be done—he repeated what *might* be done, because it was more or less a matter of chance in these cases. The dentist was not always the prime mover. He would always look at the position of the canines to see if the upper canines might be very close together, and in the second place, if they were widely enough expanded for the lower jaw to come forward. He was glad Mr. Hern had called attention to the importance of previous separation before contour filling. With regard to the chewing bar, he had had only a slight experience of it. He had used a substitute for it in the case of an old gentleman who had extensive approximal decay between the second and third

molars on both sides—the teeth were very long, and food wedged up there. It would have been quite impossible to make a contour filling in such a position, so he thought the best plan with an aged man was to bridge across the cavity, and put over that a cap of gold. Mr. Matheson believed that on a former occasion Mr. Hepburn had suggested this plan. He should like to say that Mr. Robbins need not have apologised for grinding the teeth, that was in his opinion very often the best practice, and it would often save a regulation case.

With reference to the question of large contours *versus* spaces, it was often justifiable to make a large space, as where one gets small cavities at the cervical margin, with decay as a white film extending round the neck. It being then extremely difficult to make satisfactory contour fillings, he would feel justified in boldly cutting away sound tooth substance.

Review.

Micro-organisms of the Human Teeth, by Dr. Miller. p.364, with 128 illustrations, one chromo-lithographic, and two photo-micrographic plates. Published by the S. S. White Dental Manufacturing Co.

This book is without a doubt a most important addition to Dental Literature ; from a scientific point of view it is probably the most important book that has appeared since the publication of Tomes's "Dental Anatomy." Briefly, we may say, that it fully comes up to the ideal standard we formed, when we first heard Dr. Miller was about to issue a work on the above subject.

The subject is treated of in two parts:—1st, General Bacteriological studies, with special reference to the bacteria of the human mouth ; and 2nd, The Pathogenic Mouth-bacteria and the diseases which they produce. Dental caries falls, of course, under the former heading and receives full treatment. Dr. Miller recapitulates the various views that have been held on the subject and this will and should be carefully read by all. Concerning the idea that inflammation plays a part as recently upheld by Messrs. Heitzmann & Boedecker, Dr. Miller takes and rebuts their arguments.

seriatim. We cordially agree with him that these writers "owe it to us to place their preparations before us in order finally to dispose of a subject of controversy which has already taken up enough of the time of the profession." Dr. Miller, as is well known, holds that caries can be produced outside the mouth, artificially, and that such caries cannot be distinguished under the microscope from a section of an ordinary "decayed" tooth. There is, however, one accompanying condition which Dr. Miller has never found in carious teeth worn on plates or in caries produced outside the mouth, and that is:—the transparent zone. This he designates as an "accompanying phenomenon" and not as has "been erroneously demonstrated" a characteristic. His reason being, that it is also found in "sound teeth which have been worn off, also in teeth whose approximal surfaces have been slightly worn away," in short whenever there is irritation of the dentinal fibres there a transparent zone is produced. Now we do not dispute that Dr. Miller's contention may be strictly logical, if by characteristic we understand something which occurs with a special condition and with this condition only, but practically no such hard and fast line is drawn. Inflammation of a vascular tissue may be due to many causes (irritants) but none the less is it a characteristic of each—as characteristic of a burn as of a wound due to mechanical injury. Dr. Miller is inclined to regard this zone as produced by calcification of the fibres and as evidence of a resistance offered by the tissue to the progress of the disease, in other words he is "inclined to accept the vital theory.—

We may here take exception to the preeminence which Dr. Miller assigns, either accidentally or designedly, to the tubules as against the fibrils : thus, he says, "for our purpose, dentine may be defined as a dense, glue-giving substance traversed by sheathed tubules radiating from the pulp chamber" p. 46,—but surely it would equally have served "our purpose" to have regarded it as a hard substance permeated by soft fibrils. It is as if one described the life-history of one of the lepidoptera as consisting of a chrysalis and a butterfly stage, ignoring the not unimportant period the insect spent as a caterpillar. So again on page 161 in giving a possible cause of the transparent zone, mentioned above, he says:—"the tubules are partially or completely filled with a substance" etc., as if they were not already filled (though this is, of course, granted elsewhere) and that if there

be any change it must be due to an *alteration* of the *existing* substance. Dr. Miller may, of course, not look upon the tubules as but a transition stage between fibril and matrix, possessing the resistance and indestructibility of all semi-calcified bodies, but if this be so, surely he should have, at any rate, briefly stated his views.

Seeing that Dr. Miller is so strictly logical over the use of the word "characteristic," we must criticise the use of the word "always" in the sentence "The action of acids *always* precedes the invasion of bacteria" (page 180) for though it be the rule—he has stated on the previous page that bacteria *can* and may be observed to penetrate into normal dentine. Clearly it is a rule with an exception, and the word "usually" were better used.

We have but little space left to record half the interesting and instructive topics that are here dealt with. There is the question why smoking prevents caries,—because tobacco juice is inimical to micro-organisms. The statement that starch is a greater producer of acids than sugar, and an interesting discussion thereon. The fact that since putrefaction in an agent leads to the production of an alkaline reaction, the popular notion, as to the ill results of this on the teeth is unfounded and the bearing of this on Messrs. Miller and Underwood's experiments, which were conducted in a putrescent medium. For these and much else we must refer the reader to the book itself, which each should make haste to possess himself of.

The publishers have done their part in a highly artistic manner the printing and plates being excellent, whilst handsome margins are left to the pages.

Dental News.

On Wednesday, December the 10th, a highly successful smoking concert was given by the students of the National Dental Hospital at the Portman Rooms, Dr. Maugham being in the chair. An equally successful concert was also given on Saturday, the 6th inst, at the St. James's Restaurant, Mr. Morton Smale being in the chair.

On Saturday, November the 29th, the Annual Dinner of the Past and Present students of the Dental Hospital of London was held at the Holborn Restaurant. Dr. Joseph Walker Esq., M.D., L.D.S., etc, being in the chair. A goodly number assembled, including some distinguished guests, among whom we noticed Drs. Wilks, Collins, and Messrs. Henry Power, Christopher Heath, Stanley Boyd, Bland Sutton, and many others.

Dr. Walker in proposing the health of the Past and Present Students referred to its continued growth and to the fact that the needs of the Hospital now were so great that it was proposed to open it during five afternoons a week. He also alluded to the lack of support which past students afforded the Hospital and appealed to them to rectify this.

Messrs. Wm. Maggs, May, Coysh, and Gask responded.

Among other toasts proposers and responders, were Drs. Collins and Wilks, Messrs Frederic Canton, David Hepburn, Morton Smale.

The evening was enlivened by some excellent music by the Hospital Musical Society, assisted by some talented friends, among the songs we may specially note a topical song on some of the incidents of our work, entitled a Transcen-Dental Ditty and sung by Dr. Alfred Smith to the tune of "Oh! my! the old folks sigh,"—its chorus ran with variations,—

Oh! my! the old folks sigh
 For the simpler methods of the days gone by,
 While the transatlantic nation
 Goes for bridge and implantation
 Let's shun fads in operation
 And so say I.

DENTISTRY ON THE SABBATH.

IN the Westminster County Court, his Honour Judge Bayley gave judgment in an action in which a dentist sought to recover fees for attending a Mr. Cohen. In the course of the case it was stated that a good deal of work was done on a Sunday, and the defendant contended that that brought the plaintiff within the Sunday Observance Act, and therefore the claim could not be sustained.—Mr. Raymond, who appeared for the plaintiff, argued that it had been held by the High Court that a farmer was not within the Act.—His Honour

said the defence was a shabby one, and he was of opinion that a dentist did not come within the Act. The verdict would be for the plaintiff for the amount claimed with costs.

GENERAL MEDICAL COUNCIL.

November 28th, 1890.

Dental Business.

The President, Mr. John Marshall, in the Chair.

THE Council took into their consideration the case of Thomas Hawkins, registered in the Dentists' Register as in practice before July 22, 1878. Mr. Hawkins was summoned to appear before the Council to-day, at four o'clock, on the following charge, as formulated by the Council's solicitor: "That on the 24th day of June, 1889, he did fraudulently procure himself to be entered in the Dentists' Register as a duly qualified dentist, in practice before July 22, 1878, he not having been in practice in accordance with the statement and declaration whereon he founded his claim to registration, and he not having any qualification."

THE REGISTRAR: Thomas Hawkins has been called, but does not appear. The report by the Dental Committee on the case is as follows: "The case of Thomas Hawkins having been referred to them by the executive committee to ascertain the facts in regard to such case, the Dental Committee find the facts to be as follows: That Thomas Hawkins was on June 25th, 1889, registered under the 37th section of the Dentists' Act on the usual form of request for Registration, dated May 9, 1889, and supported by the joint declaration of himself and David Holland, and a copy of his indentures of apprenticeship, from which documents it appeared that he was duly apprenticed, December, 1, 1877, to David Holland, at 71, Alexandra Road, Manchester, that his services were to be an equivalent for a premium, that he duly fulfilled all the conditions of his apprenticeship, and that his articles expired December 1, 1881, when he was 44 years of age. That David Holland, the declarant above mentioned, was born on the 12th day of December, 1859, and was therefore on the 1st day of December, 1877, at the age of 18 years only, or thereabouts. That Thomas Hawkins, during the years from Dec. 1877 to Dec. 1881, was working as a carpenter and joiner,

and in particular during the years 1877 and 1879, on one of them, was employed by the Audley Brick Company, to do the joiner's work in a row of houses they were building at Church, near Accrington, and that during the time resided at 2, Newark Street, Lower Audley. That in March, 1872 he worked regularly on buildings at Hoxton, which he was putting up in conjunction with one William Bullock, during which time he lived at Bromley Road, Huncourt. That he continued to work as a joiner up to, and after December, 1881. That in November, 1885, he entered the service of Mr. Nuttall, of Bacup, as a canvasser and collector, and continued there till October, 1888, and during the time never assisted in Mr. Nuttall's dental practice. That David Holland declared, whose proper name is David Cooke Holland, even in 1877, living with his brother, George Holland, at Blackburn, and was learning dentistry from the said George Holland, and that in September, on October, 1878, and said declarant came to 71, Alexandra Road, where for the first time he began to practise dentistry. That David Holland had no apprentice while he lived at 71, Alexandra Road, which was from the autumn of 1878 to the year 1888. The Dental Committee report these facts to the General Medical Council. John Marshall, Chairman, November, 27, 1890."

DR. QUAIN: I move that strangers withdraw.

THE PRESIDENT: Not on the facts.

DR. QUAIN: You cannot question the facts.

THE PRESIDENT: It is just the question of practice. The Dental Committee were appointed in order to investigate the case and find the facts. The Dental Committee have had all the facts before them, and we have agreed to our Report to the Council, therefore, unless the Council wishes to impose its judgment, and go into the facts itself, it may be taken that we are in a position to decide on those facts.

DR. QUAIN: If there is no dissension, the case is closed. Strangers are not to be present while it is discussed.

Strangers were then directed to withdraw.

On their readmission they were informed by the President that having deliberated upon the case of Mr. Thomas Hawkins, the resolution of the Council has been that his name and qualification be erased from the Dentists' Register.

INDEX.

	PAGE		PAGE
ABBREVIATIONS, Diversity in ...	405	Antiseptics, Comparative value of	797
Abernethy as an advertiser ...	34	Antral Tumour	59
Absorption of Alveolar Border ...	811	Approximal Decay, Etiology and Treatment ...	1106
A. C. E. Mixture	397	Arabian Medicine	887
Accident during extraction ...	794	Areca-nut Tooth-paste ...	503
Accumulators	677	Arms of the College of Surgeons	879
Ackery, J., Case by	64	Arnemann, W. Herman... ..	334, 610
Adams, G. W., Use of Soap Solution	516	Arnold, Otto, Plastics	306
Adhesion of Soft Palate due to Syphilis	510	Articulating Impressions, to take	32
Adolphus Alexander	333	Articulation, Taking it	77
Advertisement, a hideous ..	498	Artificial Teeth for the poor ...	271
— a curious	499	Athletic Club (Dental) Dinner	543, 570
Advertising Dentists	359	Atkinson, Chas. B. on Cement Work	11
Albert, H. L., on Alveolar Abscess	721	Atkinson, J. O., on Gas Operations	575
Alexander, M.	333	BACTERIA	241
Alexandrian School	885	Bag-pipe playing, effect on teeth	421, 426
Aluminium as a Dental Base ...	528	Bailey, G. H., on Anæsthesia ...	757
— Plates... ..	423	Base-plate Material	501
Alveolar Abscess	52, 72	Barens, Henry, Dry Copper Amalgams	976
Alveolar-Dental Periostitis due to errors in articulation ...	1109	Barret, W. C., Case by	322
Amadou Cylinders	1088	Bartels, Max, Tumour of Cheek	299
Amalgam Carrier... ..	117	Bays, J. Dr., on Glandular enlargement	817
American Dentists in Germany	383, 542	Bell, J. R., on Important Little Things	491
Anæsthetics	1064	Bennett, Storer, Opening Address by	865
Anæsthetists and unregistered Dentists	901	Berlin Congress	71, 108, 141, 271, 331, 431, 475, 568, 570, 609, 619, 664, 672, 714
Anæsthetic, a curious one ...	447	Bethel, L. P., on Operative Failures	785
— Action of intense cold	946	Bever, E. A., Letter from	960
Anæsthetics, Discussion on ...	327	Biggs, John A., Inaugural Address — on Irregularities ...	26
— in Dental Surgery	347, 394	Billroth, Prof., Fees for an operation	446
— The choice of	213	— on Carbolic Acid	791
Antiseptic action of Filling materials	38	Bing's Root Trimmer	122
Anatomy, Comparative, at Oxford	526	Birch, J., Charters, Letter from...	
Angle, Edmund H., on treatment of fractured jaws	484	Birmingham Dental School ...	845
Angle's Regulating and Retaining Appliances, Diagram of ...	486	— Hospital Saturday Fund	644
Annual Address, B. T. Mason's	536		
Antiseptics	697, 726		

	PAGE		PAGE
"Bite" (the) in treatment of irregularities	1111	Chloroform Commission	376, 395
Bleaching Teeth	748	— death from	273, 568, 1350
Blue Spectacles for patients ...	363	— Decomposition in Gas-	
Bogus Diplomas	561	light	997
Books advised by Dental Board in Victoria	642	— introduction of ...	741
Bousfield, Mr. Hospital Committee		Chupier, F. F., A Suggestion ...	113
Bowtell, H. B.	912	Cigarette in Bronchus	993
Boycotting the Patents	499	City v Country	945
Buzzell, W., on Robinson's Filling	400	Clarke Bruce, Hospital Conference	522
Braine, Woodhouse, on Anæsthesia	756	Clasps	200
Bramwell, Dr. on Hypnotism ...	366	Cleft Palate, specimen of ...	208
Braun, Henry C., Letter from ...	959	Clinical Teaching	978
Bridge and Crown-work 35 years ago	172	Cobbett, William, Experiences	776
Briggs, H. Fielden	47	Cobbler's thread for ligatures ...	365
— Case by	311	Cocaine, death from	1038
British Association Meeting ...	526	— discussion on	661
Bromide of Ethyl, death from ...	384	— effects of injection	404
Bromidrosis, To cure	163	— its uses	630
Broughton, Wm., on Electricity	673	— Hallucinations	112
Brown, J., on an Electric Alarm	1077	Cocaine Tabloids	940
Brown Teeth	750	Coffee as Microbe Destroyer ...	317
Bryan, L. C., Suction in Dentures	515	Cohesive Gold Filling	291, 962
Bryant, T., Case by	511	Cold (intense) in Dentistry ...	646
Buda-Pest University, Dental Department	497	Collars, to retain	1079
Bull, E., on Impression-taking ..	248	College of Surgeons of England, Council	473, 1097
Burns, To allay the pain of ...	94	— Election to	569, 662
		— Dental Examiners	608
		— Lectures	705, 958
		— Pass list	608, 1096
CAMBRIDGE UNIVERSITY, Chemical laboratory	981	College of Surgeons, Ireland, Pass lists	1006
Camphor, a solvent of iodoform	365	Collett, E. P., on Copper amalgam	388
Campion, Henry, Presidential Address	1070	Colours, The source of	517
Cancer of Tongue	412, 970	Colyer, J. F.	623
— from Smoking	992	— on Irregularities	769
Carbolic Acid, foolish use of ...	791	— on Introducing Gold Fillings	961, 1009, 1057
Caries and Necrosis	440	Committee on Hospitals	472, 518, 571, 610, 660, 719, 792, 811
Carter, J. R., Case by	511	Company, a curious one	594
Cassidy, J. S., remarks by	780	Cases for polishing	994
Caulk's Filling Materials	596	Congress Berlin (see Berlin)	
— Gutta Percha Preparations	448	Continuous Gum, New low fusing	913
Cave & Cliff Dwellers, their jaws and teeth	504	— Work	565, 708
Celluloid	24	Control of the Hospital Staff ...	540
Cements in Dental Therapeutics	987	Convalescent home, donation to-wards	383
Cedar-wood canal points	161	Cook's School of Anatomy	851
Cement work	11	Cooksey's base-plate	407
Chemant, M. De, Dissertation on Artificial Teeth	950	Copper Amalgam	338, 545, 591, 376
Children's teeth	272, 279, 1021, 1080	Coral Fillings	365
Clip blower, to improve ..	219	Cormack, D. A., on Pulpless teeth	53
Chiswick murder	218	Crowns, All Gold	598
Chlora-percha, white	368	Crown Galvano-Plastic	323
		Crystal Gold, use of	110

	PAGE		PAGE
Crystalline Gold & Foils ...	549	Dentistry in Hungary ...	621
Cumine, R. H. ...	623	Dentistry in Italy ...	155
Cummings, J. E., on Mechanical Dentistry ...	538	Dentistry in Japan ...	553
Cunningham, John P. Guy, Letter from ...	1008	Dentistry in the Army ...	596
— Dr. G., On continuous gum ...	913	Dentistry on the Sabbath ...	643
— On Implantation of Teeth ...	13	Dentition test for Cattle... ..	166
— On Notation ...	256	Denture, removed from stomach	639
Currie, Sir E. H., Hospital Conference ..	520	Dillon D. G. B. on Children's teeth	276
Curious case ...	36	Dinkler, Dr., Affection of Tongue	310
DAMAGES for Slander ...	903	Diplomas in the States... ..	880
Davis, Henry, on Anæsthetics ...	1064	Discs for mandrils ...	645
Day, Charles, death of ...	795	— Sharpening ...	645
Death following Extraction ...	911	Donaldson, D. F. on Bacteria ...	241
Deaths from swallowing denture	72, 333	Donelan, James, on Supernumerary Tonsils ...	508
Death under Nitrous Oxide	95, 191	Dott, D. B., on H ₂ O ₂ ...	407
Debating Clubs ...	360	Dreschfield, L. on Hobbies ...	774
Deciduous Teeth, care of ...	104	Dublin Dental School ...	846
Decomposition of contents of Dental Tubules ...	456	Duncan, Mathews ...	987
Degrees for London Students. ...	315	Dunn, C. H., on Dentistry in Italy	155
Dental Anomaly ...	327	Dunkerley, John W., on the Human Teeth ...	1116
Dental Association of Victoria ...	427	Duties of an Hon. Dental Surgeon	335
Dental Diploma, need of a higher	947	EARLY DENTISTRY ...	553
Dental Examinations, the results of ...	640	Eau de Cologne, formula for ...	560
Dental Graduation, extension of	71	Edinburgh Dental School ...	843
Dental Hospital of Birmingham	186	Editorials—	
Dental Hospital of Edinburgh	183, 711	A curious case ...	701
Dental Hospital of Liverpool ...	182	Advantages of our Profession	792
Dental Hospital of London Athletic Club ...	32	Artificial Teeth for the Poor	270
Dental Hosp. of London Dinner	1138	Children's Teeth ...	1080
— Prize Distribution ...	713	Choice of Anæsthetics in Dental Surgery ...	213
Dental Hospital of Manchester... ..	184	Clinical Teaching ..	978
Dental Legislation in France ...	433	Control of the hospital staff	540
Dental Microscopy ...	1008	Dental Section of Congress	108
Dental Register... ..	473	Dentistry in France... ..	443
Dental regulations in Germany... ..	594	Farewell and Greeting ...	30
Dentist, an Arab ...	447	Is a higher Dental Diploma needed? ...	947
Dentist, a Heroic ...	1090	Mechanical work and the Pupil system ...	898
Dentist, an Old ...	333	Mineral Teeth ...	738
Dentist, in Canadian Parliament	911	Mortmain Acts ...	1124
Dentist's Act New Zealand, Prosecution under ..	524	Non-registered "Dentists"... ..	313
Dentists in Germany ...	332	On to Berlin ...	
Dentists to German Army ...	333	Results of Dental Examinations ...	640
Dentistry in Canada, regulations governing ...	496	Scientific Research ...	356
— In France ...	443	State v. College Diplomas... ..	402
		Students and their Societies	162
		Success and Failure ..	494
		Teaching of Mechanical Dentistry ...	68
		To the Student ...	820

	PAGE		PAGE
Egypt, Ancient, Medical Art of	998	Gas Operations	574
Electric Alarm for Vulcanizers	1077	Gask, A. C., on Cocaine	630
Electric Light, Anodyne effects of	998	General Hospitals	852
Electricity in Dentistry	673	Genese, D., on Metal Dies	896
Elliswood, F. H.	573	Gilmour, W. H., on Root filling	1031
Empyema of the Antrum, Etiology,		Glands, Enlargement of	815
Diagnosis, and Treatment	1	Glasgow Dental School	844
— Bibliography	10	Glass Inlays	706, 1054, 1104
Enlargement of Sub-maxillary		Glass Inlays, Durability of	959, 1006
Glands	817	Goddard, C. L., on Rubber	892
Epulis, case of	752	Goffe H. Preparation of mouth	301
— Operation on	1002	Goffe, T. H., Letter from	432
Estes, D. C., on Bridge and Crown-		Gold Dust, to save	363
work	172	Gold as a filling	289
Etching Liquid	107, 415	— for Plates	25
Evans, Crown and Bridge-work	136	Gold, to fill pulp canals with	502
Everted Crown	33	Gold fillings, Methods	961, 1009, 1059
Evolution of Medicine and Surgery	877	Gold filling, (old) to make adhesive	905
Extraction and its alternatives	49	Gold Tips	111
Extraction in Irregularities	1111	Grant, President, case of	992
Extraction v. Expansion	771	Gutta-Percha	742
Exeter Dental Hospital	382	Gutta-Percha for Impressions	249
— School	850	Gutta-Percha Points, to use	501
Examinations	1086	Guy's Dental School	842
— Questions	825		
Eye-quack in Brussels	909		
		HAMPDEN, John, tooth of	796
Failures, cause of	785	Hardy, Nelson, Hospital Com-	
Farewell and Greeting	30	mittee	518
Farrar's rules for regulating	560	Harelip and Cleft Palate	511
Fashion in Teeth as in Form	218	Harlan, H. E., on A.C.E. & N2O	397
Fatty Tumours	449	Harper, Mrs., death of	568
Fees	543	Harris, H. E.	430
— curious	496	Hart, Frank, on Implantation	787
— big ones	593	Haskell, L. P., on Materials for	
Fermentation	167	Plates	23
Fight in Dental Surgery	1005	— on Arrangement of	
Fine Files	910	Teeth	149
Filling Materials, Antiseptic action	38	Harvard Dental College	473
Fitch, Dr. H. H., on Pulp Nodules	274	Hawkins, Thomas, case of	1139
Fletcher's Dental Metallurgy	956	Health in the Office	174
Flagg's Plastic Filling	527	Heath, Mr. Christopher, on Em-	
Fletcher, Thomas, Letter from	527	pyema of the Antrum	79
Florain, Dr., Action of Saliva		Henley, L. H., on taking an Ar-	
Forth Bridge	317	tication	77
Fox, Oct. A., Letter from		Hepburn, David, A Slide Section	
Fractures of Maxilla	1073	Tray	63
Fractures, Angle system of treat-		Hern, Wm., Address by	150
ment	484	Herpes Zoster	111
— Compound, of maxilla		Hickory Root-fillings	462
and nasal bones	64	Hill, Dr. Wm., on Rhino-pharyn-	
French army, Dentistry in	499	geal Disease	529
		Hobbies	774
		Hoff, N. S., on Sanitary Science	
		in Dentures	152
		Holford, W. S.	916

	PAGE		PAGE
Honorary Degrees ...	569	Keevil, G. M., on Sensitive Dentine ...	350
Honour to English Surgery ...	406	Kellong L. T. Protection of Pulp ...	995
Hooper, Gordon ...	1006	Kingsley Norman, on Irregularities ...	
Hospitals and the public ...	900	Kirton, W. H., Letter from ...	1056
Hospital Reports ... 47, 95, 144, 191		Kola Nut ...	560
239, 336, 432, 480, 528, 623, 824		Koucharsky, Dr., Tragic death... 1002	
Hospital Sunday Fund ...	609		
Houses, famous ones ...	592	Laboratory, need of ...	1087
Hulme, R. G. ...	190	Lancet's Leader... ..	1042
Hundred Miles from a Dentist ...	1043	Lane, Ernest J., Case by ...	510
Hyperostosis of Upper Jaw ...	600	Laneline	221
Hypnotism ...	366	Laplace, on Fermentation ...	167
— Mr. Blandy on ...	452	Lapsus Linguae ...	447
— Dr. Bramwell's Experiments on ...	446	Larvæ, of Flies in stomach and mouth ...	605
— Charcot on ...	452	Lawrence, G. H., Letter from ...	334
— Demonstration by Professor Bernheim on ...	451	Ledlie, D. A. Case of swallowing a denture ...	481
— Danger of ...	737	Leech in Larynx ...	415
— Sir A. Clark on ...	559	Legacy, for free extractions ...	429
Hysterical Facial Paralysis ...	1034	Legal ...	
		— Arnemann, Case of ...	334
Inaugural Address, by John A. Biggs ...	26	— Dentistry on the Sabbath ...	1138
— by L. Matheson ...	291	— Edwards <i>versus</i> Maurice... ..	430
India-rubber trees, plantation of ...	544	— Eskell <i>v</i> John Butters ...	239
Individualism	953	— Fight in Dental Surgery... ..	1005
Influenza Epidemic	316	— Kirton <i>v</i> Smith ...	767
Immediate root-filling ...	56, 649	— Partridge <i>v</i> . Medical Council ...	92
— Torsion	281		
Implantation of Teeth ... 13, 101, 787		— Paterson <i>v</i> Allen ...	1052
Impressions in Composition ...	514	— Ridge <i>v</i> . Nevitt ...	824
Impression-taking ...	248, 907	— Stewart <i>v</i> . Lowe ...	1052
— taking lower ...	78	— Wood <i>v</i> . Faubell... ..	188
Inlays, Porcelain ...	369	— Wright <i>v</i> . Cole ...	815
Iodi-Hydrarg. ...	904	Legislation in Canada ...	1099
Iodoform, odour neutralized ...	32	Leslie, J., on Crystalline gold ...	549
Iodol	362	Leukoplakia of tongue ... 455, 971, 992	
Irregularities ...	321, 1126	Liberty or License... ..	35
— Treatment of ...	385, 769	Linking Loose Teeth ...	164
Italian Dental law ...	569	Linnel, P. A., on Torsion ...	942
Italy, Dentistry in ...	155	Listerine ...	318
— degrees re dentistry ...	1003	Liverpool Dental Hospital ...	849
— Suppression of quackery ...	526	Liverpool Dental Hospital, Annual Meeting ...	663
		Local Anæsthetic, Todd's ...	412
JOHNSON, C. N., on making splints ...	906	London Dental Hospital ...	838
Jones, N. Handfield, on Individualism ...	953	Lonnon, Frederick ...	526
"Jumping" the bite ...	1114	Lower Incisors, cases of absence of ...	1131
		Mackenzie, Sir Morell, Hospital Committee ...	
		Maggs, Mr., Case by ..	464
		Malingering practices in India ...	795

	PAGE		PAGE
Mallachow, C. F., Death of ...	382	— Mouth wash ...	44 ²
Mallet, Automatic ...	962	— On Peroxide of Hydrogen ...	409
— Engine ...	963	Mineral Teeth ...	738
— Electric ...	963	Minneapolis City Hospital, case in ...	487
— Hand ...	962	Minnesota University, Dental In-	
— Method of holding ...	967	firmary, case in ...	488
— Pneumatic ...	962	Mummery, J. Howard, on Micro-	
Malpractice, case of ...	701	organisms ...	924
Mammalia, teeth of ...	1118	— On Microscopical sections ...	578
Manchester Odontological Society ...	131	Mummy cat's skull ...	371
233, 277, 375, 563, 707, 807, 1091		Murray, Harold ...	333
Materials for Plates ...	23	Musical Society ...	383
Matheson, L., Address by ...	201	Myeloid Epulis, case of ...	361
Matheson, L., on relations of			
upper and lower teeth ...	1105		
Maxfield, G. A., On antiseptics ...	697		
	729		
Maxwell, F. S., On care of milk		NASAL Obstruction, case of ...	703
teeth ...	104	National Dental Hospital ...	840
May, W., on Children's Teeth ...	1021	— Dinner ...	1085, 1097
McColl, J. H. ...	430	— Lecture at ...	1004
Mechanical Dentistry, teaching of		Necklace of Human Teeth ...	1129
68, 143		Necrosis of Upper Jaw ...	1085
Mechanical Dentistry, neglect of	538	Negroes, Meharry Medical College	
Mechanical training ...	898	for ...	525
Medical Annual Review ...	334	Neuralgia, Case of ...	312
Medical Council ...	615, 1139	— Causes of ...	109
Medical Council, Dental repre-		— Excision of nerve ...	37
sentative ...	981, 992	Newton, Richard C., on Teeth in	
Medical School, functions of ...	414	Diagnosis ...	74
Menthol as an Antiseptic ...	263	Nitrous Oxide, action of ...	1088
Melbourne Dental Hospital ...	642, 1081	— Analysis of Cases ...	681
Mercury, bichloride ...	732	— Death under ...	663
Metal dies ...	886	Nizam's Dentist ...	958
Methyl-violet as an Antiseptic ...	1044	Noble, H. B., on Health in the	
Modelling Compound ...	249, 658	Office ...	174
— for splints ...	960	Non-cohesive Gold Filling ...	296, 1057
Morgan, N., or Rubber gum-		Non-metallic Plastics ...	306
facings ...	654	Non-registered "Dentists" ...	313
Mortmain Acts ...	1124	Norris, John ...	573
Morton, J. E., Caries and Necrosis	440	Norton, Harvey H., Case of Tra-	
Moser, H., Case by ...	437	cheotomy ...	509
Motors, electric ...	680	Notation, International Dental ...	256
Mountford, J. ...	912	Noyes, Edmund, on Immediate	
Mouth Breathing and Caries ...	193, 261	Root-filling ...	
Mouth-mirror, new form ...	43		
Mouth washes ...	219, 414	Obituary Notices, Hill, W. ...	479
Mouth wash, Miller's antiseptic	448	— Sleep, Mr. ...	478
Microscopical Preparations, by		Objective, new apochromatic ...	405
Henry Sewell ...	466	Odontalgia, novel treatment ...	37
Micro-organisms in caries ...	924	Odontological Society, ...	70, 79, 118,
Microtome, a cheap one ...	564	221, 371, 416, 463, 597, 760, 857, 1128	
Miller, Dr., W. D., on Antiseptics	797	Odonto Chirurgical Society ...	26, 46
— Antiseptic action of fillings	38	177, 227, 412, 859	
— Decomposition in denti-		Oesophagus, denture in ...	570
nal Tubules ...	456	Osborne, W., on Anaesthetics	347, 394
— Lecture by ...	1004	Offensive breath, to correct ...	622
— Micro-organisms (Review)	1135	Onesidedness of the Face ...	164

	PAGE		PAGE
Oral secretions in pregnancy ...	217	Larvæ of Flies in stomach and mouth ...	625
Original Articles—		Low Fusing Continuous Gum ...	913
Account of Dental Legislation in France ...	433	Materials for Plates... ..	23
A. C. E., and N.O....	397	Metal Dies	896
Action of Human Saliva on Plants, etc. ...	305	Method of Introducing Gold Fillings ...	961, 1009, 1057
Agency of Micro-organisms in caries ...	924	Mouth breathing as factors in caries, etc., ...	183, 261
Alveolar Abscess	271	Neglect of Mechanical Dentistry ...	538
Anæsthetics	1064	Non-metallic Plastics for fillings ...	306
Anæsthetics in Dental Surgery ...	347, 394	Opening Address	865
Analysis of Nitrous Oxide Administrations ...	681	Peculiar affection of Tongue's Mucous Membrane ...	310
Angle System of treating Fractures ...	484	Periostitis following Influenza ...	437
Of the Maxillary Bones		Physiology and Treatment of Sensitive Dentine ...	350
Antiseptics in Dentistry ...	697, 726	Preparation of mouth for Artificial teeth ...	301
Arrangement of Teeth ...	149	Presidential Address ...	1070
Bacteria	241	Preparation of Microscopical Specimens ...	578
Care of deciduous teeth ...	104	Points in relation of upper to lower teeth ...	1105
Caries and Necrosis	443	Position of Dentistry in Italy ...	155
Case of Tic Dolooureux ...	577	Rhino-pharyngeal and Dental Disease ...	529
Cause of operative failures..	785	Robinson's Filling	400
Cement work and experiments therein ...	11	Root Fillings	1031
Cocaine, and its uses in Dental Surgery ...	630	Rubber	192
Copper Amalgam	338	Rubber gum-facings ...	694
Development, anatomy, &c., of human teeth ...	1116	Sanitary Science in Dentures ...	156
Dry Copper Amalgam ...	976	Some Remarks	780
Early Diagnosis of Surgical affections of the Mouth ...	699	Specimen of Cleft Palate ...	208
Electric alarm for Vulcanizers ...	1077	Structure and development of Ovarian Teeth... ..	342, 391
Electricity in Dentistry ...	673	Treatment of Children's Teeth ...	1021
Etiology, Diagnosis and treatment of Empyema of Antrum ...	1	Treatment of Irregularities... ..	385
Evolution of Medicine and Surgery	877	— — — — —	769
Extraction and its alternatives ...	49	Treatment of Pulpless Teeth ...	53
First premolar in the typical dentition	145	Unusual form of Tumour of the Cheek ...	299
Case of Fracture of Maxilla ...	1073	Vagaries of a Toothplate ...	481
Gold as a Filling	289	Original research, Sir H. Roscoe on ...	740
Hobbies, and how to ride them ...	774	Ornithorhynchus, teeth of, ...	794
Immediate Torsion	942	Opening Address	865
Implantation of Teeth ...	13, 787	Otto of Rose	804
Implantation, Replantation, and Transplantation ...	97	Ovarian Teeth, structure and development ...	342, 391
Improved sand-moulding flask ...	152	Owen's College, Dental Department ...	847
Important little things in Dentistry	491	Owen, Edmund, Case by ...	511
Impressions and Impression taking	248	— On Salivary Calculus ...	746
International Dental Notation ...	256	— Sir Richard	426

	PAGE		PAGE
SALIVA at onset of Rabies ...	1020	Stenosis of Pharynx ...	362
— its action ...	305	Stewart, T. W. F., accident to ...	811
Salivary Calculus ...	361, 746	St. George's Hosp., Foundation of ...	877
Sand, as an imbedding agent ...	364	Students, and their Societies ...	162
Sand, Bench ...	500	Student's Society, Edinburgh ...	332, 1050
Sand, Moulding flask ...	152	— — Dinner ...	384
Sandhurst, Lord, President Hospi- tal Committee ...	525	Student's Society, Liverpool ...	380, 1001
Sanitary Science in Dentures ...	156	Student's Society, London Dental Hospital 88, 125, 181, 230, 329, 660, 1046	
Saunders, Sir Edwin ...	1001	Student's Society of Manchester ...	567
Schelling, Carl, on Gold filling... ..	289	Student's Society National Dental Hospital 135, 380, 417, 562, 969, 1000,	
Scholarship to Glasgow School... ..	705	Student's Society of New York ...	455
Scientific Associations ...	857	Subjective Sensations in the Mouth ...	360
Science Laboratory, need of ...	979	Success and Failure ...	494
Scientific Research ...	357	Saccharin as a Flavouring agent ...	501
Scott's Pulp Devitalising emulsion ...	448	Suction of Dentures ...	515
Semon, Dr. Felix, on Empyema of Atrum ...	I	Sulpho-cyanide of Potassium its Therapeutic effects ...	305
Sensations referred to the mouth ...	454	Supernumary teeth ...	324
Senator, Prof. W., Article by ...	625	Surman, Robert J. ...	824
Sensitive Dentine, obtundant ...	1908	Sutton, J. Bland. Case by ...	59
Sensitive Dentine Obtunder ...	1041	Sutton, J. Bland, on Fatty Tumours ...	449
Sensitive Dentine, Physiology and treatment ...	350	— Ovarian teeth ...	342, 391
Separator. The Universal ...	318	Swain, E. D. on Gutta-Percha... ..	742
Shell Corners, for defective teeth ...	373	Swallowing Denture, Cases of 72, 73, 333, 370, 481, 630	
Shooting Judge Bristowe ...	334	Swedish Dental Journal.. ..	478
Sight, defective, curious reason... ..	316	Symington, Johnson, on Cleft Palate ...	208
Silk, Dr. J., on Nitrous Oxide ...	25	Syphilis conveyed during circumci- sion ...	572
Silver... ..	415	— From Bite ...	993
Skeletons, prehistoric, teeth of... ..	325	Syphilis, inoculated by instruments ...	413
Skin, Grafting with grey hound's ...	62	Syringing, Antiseptic ...	659
Slide Section Tray ...	992	Taking a bite, to prevent forward movement of lower jaw ...	1126
Smale Morton, Letter from ...	992	TALBOT, Eugene S., on Cave and Cliff Dwellers ...	504
Smell of Lubricating oil, to dis- guise ...	493	— on Irregularities ...	316, 321, 1126
— Vulcanizer ...	493	Targett, J. H. ...	1001
Smoking Concerts ...	381, 1127	Tasmania, Dentistry in ...	902
Snow, George B., New Method of vulcanizing ...	982	Teeth, arrangement of ...	149
Soaps ...	326	— in Diagnosis ...	74
Soap Solution ...	516	— in Childhood, ...	217, 272, 276, 1021, 1080
Spatulas for Cements ...	493	Teeth, the human ...	1116
Splints, a simple method ...	206	Thinking on your legs ...	658
Spicer, Dr. Scanes, on Mouth Breathing ...	193, 261	Thompson, A. H., on Cements... ..	987
Splint, Anchor Diagram of ...	485	— J. Hilton, on Reflex Sensations... ..	454
— in Modelling Composition ...	960	Tic Douloureux, case of ...	577
— Vulcanite, to make in two hours ...	500	Todd, Fred ...	430
Stack, Dr., Presentation to ...	1095	Tomes, Mr., Case under care of ...	975
Stamping pieces ...	503	Tongue, Peculiar affection of ...	310
Stanley, H. M., gift to Odonto- Society ...	1129	— Urticaria of ...	976
Staples, George, on Modelling Com- position ...	514		
Starr Louison, Primary Dentition ...	319		
State <i>versus</i> College Diplomas ...	402		

	PAGE		PAGE
Tonsillotomy, Bloodless ...	994	Vienna University, Dental Depart-	
Tonsils, Supernumerary ...	508	ment ...	497
Tooth, a long ...	324	Vulcanizer burst ...	335
— in nasal cavity ...	644	Vulcanizing, New Method ...	982
Toothpick for Tracheotomy tube	509	Vulcanized Rubber ...	24
Toothplate, Vagaries of ...	481		
Torsion, Immediate ...	942		
Tracheotomy under difficulties ...	509		
Transplantation ...	99		
Trays, for odd Teeth ...	365	WALKER, Gilbert, Letter from...	1006
Trespassing Dental Titles 1007,	1055	Wallace, James, Letter from ...	528
Trout, a voracious ...	455	Warbury, Dr. ...	498
Tuck, R. H., on fractured maxillæ	1073	Ward's Electro Metallic Plates...	26
Tumour of Cheek ...	299	Warm Dressings ...	363
Turner, Arthur ...	190	Wax for Capping Pulpes ...	364
— J. S., Letter from ...	1056	Wax Impressions, Coates' Method	364
		Weeping gums, To check ...	502
UNION between gum and perios-		Weiss, Felix. Presentation to ...	429
teum, to produce ...	422	Wills, Mrs. Horace. Death of ...	247
Unique letter ...	981	White, Dr., on Hickory Root-	
Upper jaw, Removal of ..	323	Filling ...	462
Uniting Porcelain to Amalgam...	627	White, T. Charters, on Ovarian	
Universal Separator ...	220	Teeth ...	342, 391
		Williams, E. Lloyd, Case by ...	59
		Williams, H. Lloyd ...	430
		Wilson, Andrew, On the first pre-	
		molar ...	145
		Winterbottom, Aug., Introductory	
		Address by ...	877
Valedictory Address ...	150	Wood, F. C., on Tic Dolooureux	577
Venetian Fête in Dublin...	215, 383	Wood v Faubell ...	188
Verrier, A. B., Letter from ...	1104	Woodburn, J. Cowan, Case by...	1002
Victoria Dental Hospital...	848	Woodcock, C., Death of ...	811
		Woodhead, Dr. G. Sims ...	473

7 DAYS

THIS BOOK MAY BE KEPT FOR

7 DAYS ONLY

IT CANNOT BE RENEWED

270A-3-71

Author

H.R. Abbott
Mem. Lib.

Title British Journal of Dental Science, 1890. v. 33

1884

DATE.

Feb 17/60

NAME OF BORROWER.

Abbott

Harry R. Abbott Memorial Library

V.B 3 (1890)

FACULTY OF DENTISTRY
124 EDWARD ST.
TORONTO 101

